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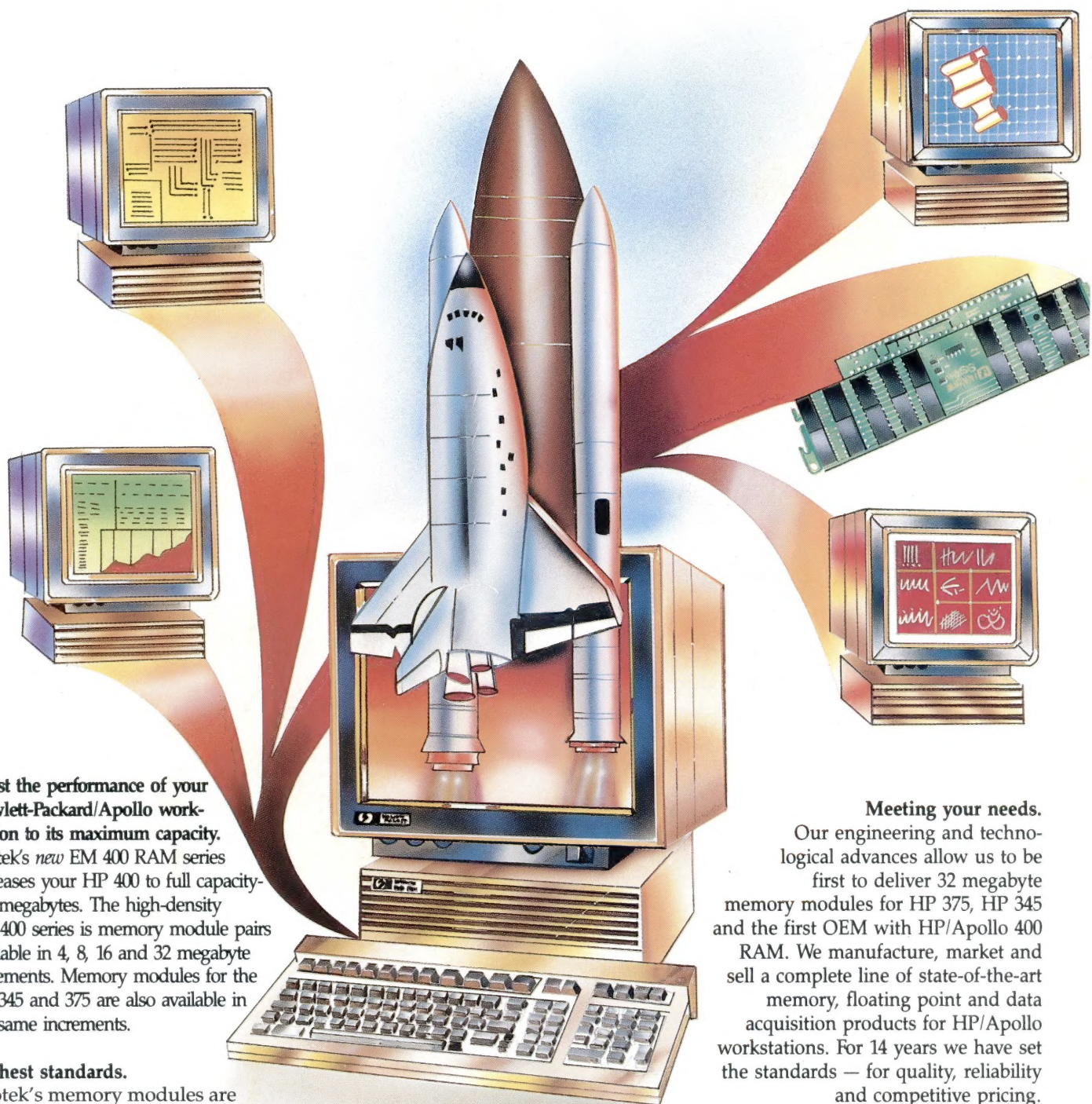
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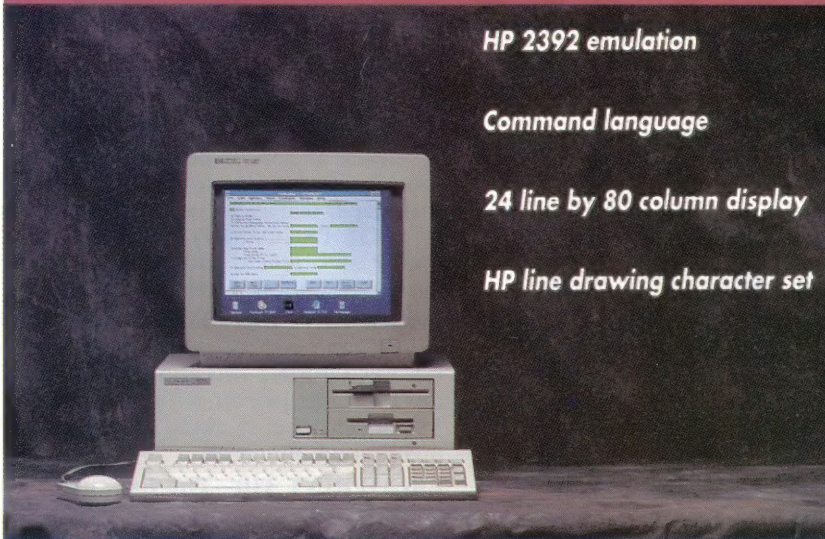
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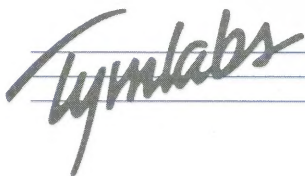
When it comes to Windows, WRQ doesn't share the Tymlabs vision. As recently as 1988, WRQ told you that Windows would never fly. That same year we shipped Session for Windows 2.0. Last June, just three weeks after the Microsoft release, we shipped a version of Session for the amazing new Windows 3.0.

Now, as WRQ begins to ship their first Windows product, we're shipping two, all-new versions of Session for Windows and

NewWave. Both packed with enhancements that stem from years of Windows experience.

Head to Head. Like Reflection, Session can emulate a 2392 terminal . . . but Session adds 700/92, 700/94, HP ANSI, and VT-100 emulation. While Reflection provides only a 24 x 80 character display, Session lets you set your window for up to 160 columns and as many lines as your monitor will allow.

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UNIX And “Computopia”

It used to be that UNIX shows were small, almost claustrophobic, congregations of the devoted. Time was, and it was not such a long time ago, that UNIX gurus gathered just to talk techie. They wore their hair long, lounged around in jeans and worshipped the operating system of their choice.

Occasionally these techno-wizards took time out to ponder what computing would be like in times to come. They thought of UNIX as a stepping stone to a sci-fi world of one big network. In this futuristic “computopia,” things like operating systems and communications protocols would be of no concern. Access to all the computing power a user could ever need would be at his fingertips, and not just at the office, but everywhere.

Sound familiar? Even HP’s Lew Platt, vice president of the Computer Systems Organization and by all accounts a pretty down-to-earth guy, can’t resist the science fiction fantasy when talking UNIX. Speaking at the Uniforum show in January, Platt outlined his vision of the future. UNIX and open systems, he claimed, “will usher in an era...where computing resources exist as an invisible infrastructure, like a power grid, where users can access data or CPU cycles or add a new software package as easily as plugging a kitchen appliance into a wall socket.”

Exit Hackers, Enter Hype?

It seems the closer we get to making “computopia” a reality, the less we see of those old, unkempt UNIX visionaries. At UNIX Expo last fall and again at Uniforum, the bohemians were behind the scenes—if they were there at all. As cooperative computing becomes the norm and the big vendors begin to support increased levels of systems integration, those hip old hackers seem to have lit out for the virtual territory.

The speed with which their departure has taken place is unparalleled, even for the computer industry. This was no long, slow ride into the sunset. Our long-haired heroes were gone in a flash. Indeed, before we could do a decent double take, they were replaced by that staple of thriving industries: salesmen in suits. Before we knew it, new, clean-cut representatives of UNIX weren’t imagining the future anymore, they were hawking business applications. Once again, the prophetic had been successfully transformed into the profitable.

In the UNIX market, the big vendors are vying for dominance, which means they are also vying for your attention. They’re mugging and posing for the crowds, blustering and speechifying about their love for UNIX and their commitment to open systems. The problem is that they are, for the most part, men of the moment. They may offer some perfectly useful

products for today, but they have no vision of the future. Consequently, they don’t really offer what you need—a path from here to there.

The Future Is Practical

There is no doubt that the demand for open systems is here. If you’re like most MIS managers, you’ve got a mixture of hardware and software platforms to worry about. You’ve got a proprietary mainframe- or minicomputer-based data center for the company, a renegade division with a multiuser UNIX system, three different departments with three different kinds of PC LANs, and any number of standalone PCs and workstations. Open systems is your only answer.

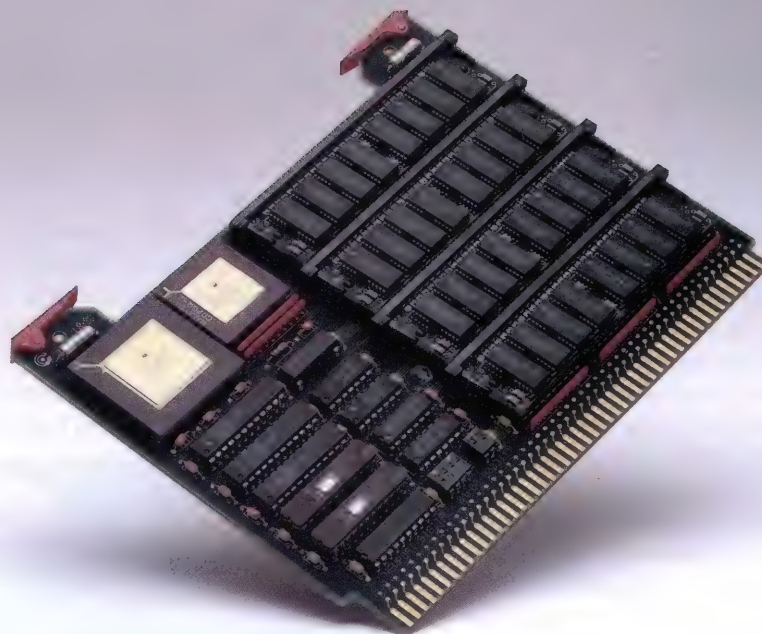
Likewise, there is no doubt that the demand for UNIX is here—for now, anyway. UNIX remains the primary *modus operandi* for open systems, client-server computing. Perhaps someday, through the efforts of standards coalitions like the OSF, we will see a new standard operating system evolve out of UNIX. In all likelihood, we’ll soon arrive at a point when the choice of operating system no longer matters. But until then, UNIX is essential for interoperability.

You may not look like an old UNIX cowboy—for that matter, neither does Lew Platt—but of necessity, your vision of computing’s future is similar. To solve business problems, you need to provide your company with easy access to dispersed information and computing resources. You need this now, as much as it is possible, and you need to take steps toward further integration. Interoperability and connectivity (a.k.a., UNIX and open systems) are the keys to the future. Fortunately for the HP user, they are also the keys to NewWave Computing.

A thought occurs to me: Maybe the visionaries never left us after all. Maybe they’ve just cut their hair and come to look more like you, and me. Perhaps, what they envision doesn’t seem so futuristic anymore because it isn’t so far away.

If this is so, the only difficulty we’re faced with is separating the soothsayers from the salesmen. So far, HP’s NewWave Computing strategy offers the most coherent articulation of a truly open systems architecture. HP’s job is to keep us convinced. NewWave Computing must continue to provide solutions available today, but designed with “computopia” in mind.

Don Marks



General Description

The TURBO-33 is a 33 Mhz accelerator card for Hewlett Packard Series 9000 computers. The card contains a Motorola 68020 processor, an optional Motorola 68882 coprocessor and 1 to 4 megabytes of 80 nanosecond dynamic ram. An internal 32 bit data bus provides high speed data transfers between the processors and the memory.

Compatible Models

The TURBO-33 is compatible with the HP 216, 217, 220, 226, 236, 237, 310 and 320 workstations. The card uses one slot in the host computer.

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Interpreted Programs	Integer Arithmetic	6 to 7
	Real Arithmetic	9 to 11
	Real Transcendental	32 to 63

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INDUSTRY WATCH

Bill Sharp

Yes, We're Open

Lately, HP has been talking about making MPE a more "open" operating system. One of the ways it plans to do this, for example, is by making the venerable OS POSIX-compliant. But proprietary systems from any vendor are known for being tailored to do certain kinds of jobs better than ho-hum vanilla solutions. They aren't known for being "open."

Achieving POSIX compliance for the commercial MPE operating system is part of HP's plan to keep its 3000 customers happy right where they are. In the midst of what in the marketplace seems like a pell mell stampede toward open systems, sales of HP's proprietary commercial system continue to chug along at a 10 percent growth rate.

The conclusion HP draws from this apparent contradiction is that users are reasonably happy with the level of "openness" already provided by MPE, and they see more on the way. POSIX compliance is part of HP's efforts to connect the HP 3000 to other minicomputers, workstations, PCs and mainframes, regardless of whose label they wear.

MPE already is regarded as the most open of proprietary operating systems by market analysts, points out Korak Mitra, product line manager for open systems with HP's Computer Systems Division, Cupertino, CA. "But the idea behind POSIX is that even with existing MPE applications, customers will derive more value if they can connect to all the other systems and move information around freely," he says.

Mitra sees four primary benefits to MPE users from POSIX compliance.

■ **Interoperability.** POSIX allows the us-

ers' applications to move freely from one system to another.

■ **Portability.** POSIX makes it possible to provide MPE users access to new, desirable UNIX applications. HP has a "best in class" program to select and port new applications to MPE.

■ **Currency.** Current trends place most of the new, leading-edge capabilities such as

important to hardware and software vendors is freely licensed source code and board availability. "We are also taking initiatives along those lines," says Osaka. "We will provide interfaces that are stable to outside vendors. We will be moving to standard hardware interfaces to allow people to pick the best peripherals on the market."



CASE tools, 4GLs, networking and graphics in UNIX first. POSIX makes it possible to move them over more rapidly to MPE.

■ **Freedom of choice.** As customers and VARs develop new software products, POSIX compliance for MPE gives them more choices in distributing the products.

The O Word

"'Open' has become a marketing hype term," says Glenn Osaka, HP 3000 marketing manager for the Computer Systems Division. Overuse and abuse of the term has made it next to meaningless, he says. He tries to avoid the term. "Customers tell us they want easy application portability and access to other vendors' systems. They want to get the best technology in their environment.

"We can deliver all of those benefits without running a UNIX operating system," he states. Vehicles like POSIX are the reason.

A second definition for "open" that's

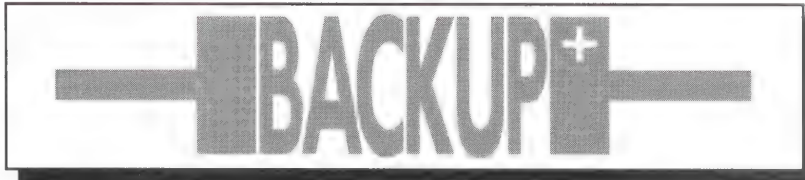
"If you take any definition of open, we are moving in that direction to make sure our customers don't suffer," says Osaka. "If I could get away with it, I would call MPE open, but there are only two pigeon holes, and MPE is considered proprietary."

No Forced March

HP's efforts at opening up MPE aren't intended to coax or drive users away from the operating system, according to HP. Osaka says some users fear that POSIX and similar additions to MPE are intended as a bridge over to UNIX, and that HP will drive users in a forced march over that bridge.

This perception of POSIX "has flabbergasted us," says an exasperated Osaka. "In fact, we are providing an option for existing 3000 customers to be able to take advantage of new solutions in a way that maximizes our probabilities for success. This is not part of a migration plan to

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BACKUP+/XL virtually eliminates system downtime by allowing users to work during the backup, with unrestricted read and write access, while running with very low overhead. On restore, files are returned to their status at the end of the backup, providing complete data protection during the backup.

Unattended backup

BACKUP+/XL provides several solutions for unattended backup, reducing or eliminating operations requirements, including deferred backup using disc for interim storage, disc-to-disc backup with optional dump to tape, concurrent backup to multiple tape drives, and backup across a network.

New device support

BACKUP+/XL supports all backup devices, including tape, DAT, 8mm, and optical disk. High-density data compression can increase the capacity of a backup device by 4 times or more, protecting your existing hardware investment and fitting your full system backup onto a single DAT or 8mm tape.

Security

BACKUP+/XL stores multiple TurboIMAGE/XL databases with full DBSTORE-compatibility, provides DES-standard data encryption, stores the system DIRECTORY with the backup, and recovers data from corrupted tapes. Files can be restored onto any HP3000 system for disaster recovery purposes.

Tape management

BACKUP+/XL's Tape Manager & Librarian module prints tape identification labels, selects, expires and scratches tapes, prevents active backups from being overwritten, identifies unreliable tapes, and allows quick online lookup of all backup attributes, including files contained on tapes by name.

CONTACT YOUR ORBIT SUPPLIER FOR A FREE DEMONSTRATION



ORBIT SOFTWARE (USA) INC, 319 DIABLO RD, DANVILLE, CA 94526 (800) 6-ONLINE or (415) 837-4143, FAX (415) 837-5752

ORBIT NV (Benelux)	ORBIT Logiciels (France)	ORBIT GmbH (Germany)	ORBIT Italia (Italy)	ORBIT España (Spain)	ORBIT ApS (Scandinavia)	ORBIT Far East (Singapore)	ORBIT Ltd (UK)
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UNIX." Successful computer vendors like HP generally have a higher profit margin on proprietary systems than they do on open systems such as UNIX, where they have more competition. This gives them a disincentive to move customers to UNIX from their proprietary systems.

HP doesn't release numbers that make it possible to determine what kind of profits they make on 3000 systems, but they aren't likely to be exceptions to the rule. Making customers happy and keeping them on the 3000 is probably very good for HP's profit margin. And, if

they have the solutions they want in a reasonable time frame, reasons HP, why would users take the trouble to change?

Mitra points out that HP 3000 users have other advantages, too. Because the 3000 is designed for certain types of transactions, transaction processing is faster on that system than on the UNIX-based HP 9000, he says. System management functions also may be better, he

"We Saved 53 Days On A 61 Day Project Thanks To S/COMPARE- HARMONIZER™"

Sound Unbelievable?

That is the actual experience of an S/COMPARE-HARMONIZER user as described in a leading industry publication. (We would be happy to give you more details.)

ALDON Computer Group's S/COMPARE-HARMONIZER is an easy-to-use software integration system that simplifies the process of applying custom changes to new releases of packaged software.

S/COMPARE-HARMONIZER users say it can save you 70% to 80% of the time your programmers have to spend on the tedious task of identifying custom changes and integrating them into new releases.

S/COMPARE-HARMONIZER is also advocated by programmers and auditors for the purpose of ensuring adequate change control. It provides you with a simple method to create documentation of all changes you make to source code.

ALDON Computer Group is an industry leader in producing software quality assurance and change management tools. The firm was founded in Oakland, California in 1980. Today, ALDON products are in use worldwide at over 1200 sites.

See For Yourself.

S/COMPARE-HARMONIZER can be as valuable to you as it has proven to be to so many other HP3000 MPE and MPE XL users. Call us today for your free trial and then start planning what you will do with all the time you save.



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(415) 839-3535
FAX (415) 839-2894



Thanks to mechanisms like POSIX, the real difference between MPE and UNIX is becoming rather simple.

adds. "If you are a 3000 user who wishes to evolve to open systems, it would make more sense to stay with the 3000, and change gradually. This is what many will do," he says.

The Real Difference

Thanks to mechanisms like POSIX, the real difference between MPE and UNIX is becoming rather simple, say Osaka and Mitra. HP-UX users will have the latest and greatest new open systems capabilities as soon as they reach the market, while there will be a delay in getting these same capabilities to MPE users. In the meantime, MPE users will have the very best in transaction processing capabilities, which will reach HP-UX users a little later.

But even this is a relatively short-term distinction. As links between operating systems pervade the market, operating systems will be less and less important. Users will want to know about capabilities, not MPE versus UNIX. If good links exist, the OS won't be a significant problem anymore. Osaka believes this could happen in as little as two or three years if standards building continues apace.

CIRCLE 163 ON READER CARD

Sure It's Wireless But It's Not LXE

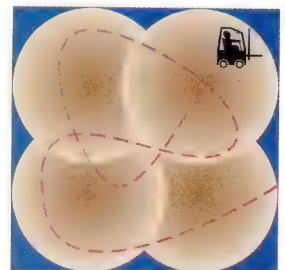


With LXE, You Can Go As Far As You Wish. Without Switching Channels.

LXE's new ExCell technology eliminates the need for multiple channels. ExCell means unrestrictive mobility for your operators. With ExCell's intelligent sensing capability, operators can move from one RF "area" to another or even from one building to another without losing contact with the host computer.

LXE's new ExCell architecture is the industry's first single-channel RF system that can cover your entire facility. One channel simplifies your operation and increases the flexibility of your entire RF network.

No other wireless company offers as many RF solutions and comprehensive customer support as LXE. You get more terminal options, more connectivity and more industrial experience. LXE is industrial strength wireless data communications. To learn more about our new ExCell architecture, call an LXE Project Coordinator today at (404) 447-4224.



Tektronix Announces Tekflex To Modify TekXpress Terminals

Customers Able To Specify Product, Service And Manufacturing Needs

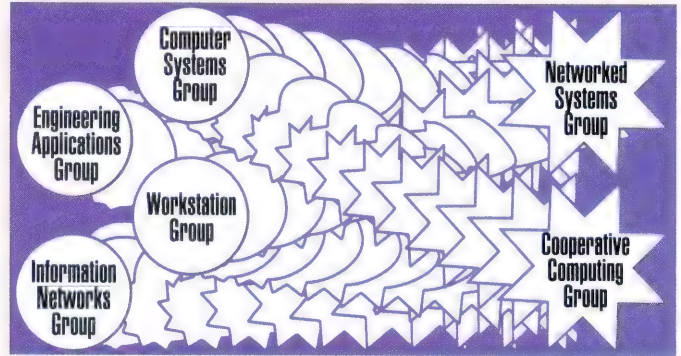
Tektronix Inc. introduced TekFlex, a business strategy that offers system integrators and resellers the opportunity to modify TekXpress X terminals according to specific product, service and manufacturing needs.

The modular design of the TekXpress color X station family supports creation of customized hardware solutions using a variety of third-party monitors, keyboards and other input devices.

Another product available under the TekFlex frame-

work is the XP20 vertical logic module. The base model XP20 with a grayscale option that offers 1280 by 1024 resolution with 16 shades of gray is priced at \$3,000. A color version with 1152 by 900 resolution is available for \$3,500, while an XP20 supporting 1280 by 1024 resolution is priced at \$4,000. Participation in TekFlex requires a minimum 50-unit purchase. Contact Tektronix Inc., Wilsonville Industrial Park, P.O. Box 1000, Wilsonville, OR 97070; (213) 785-0515.

Circle 398 on reader card



HP Streamlines Computer Systems Organization

Changes Help Implement NewWave Computing Strategy

HP announced the further streamlining of its Computer Systems Organization (CSO) to better implement its standards-based cooperative-computing strategy, NewWave Computing.

HP merged the Computer Systems Group, the Workstation Group, the Information Networks Group and the Engineering Applications Group into two new groups:

- The Networked Systems Group, which has responsibility for product development and marketing for workstations, multiuser systems and servers, development and licensing of PA-RISC, core networking, operating systems languages, databases and system-platform integration.
- The Cooperative Comput-

ing Group, which has responsibility for product development and marketing for HP's distributed-computing and distributed-application environments, application-development environments, applications, user interfaces, and office and personal network products.

HP also announced it will focus additional resources on the telecommunication market where HP is combining its computing technology and its test-and-measurement business.

The NewWave Computing strategy enables customers to select the best computer products from HP and other vendors and to link them in networks that make information and services easier to acquire, share, use and manage.

Cyberchron, HP Ruggedize Series 10000

Agreement Valued At \$50 Million

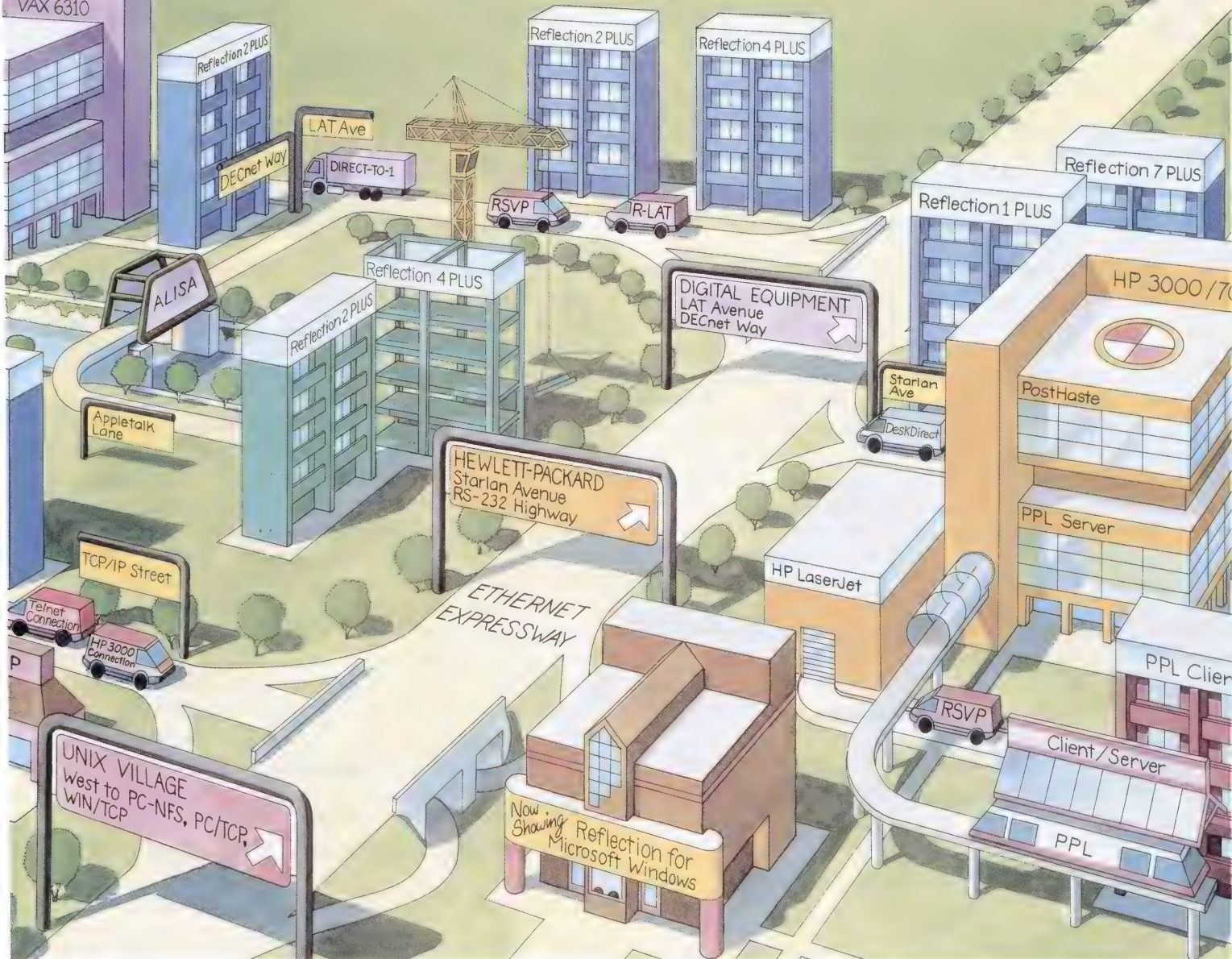
Cyberchron Corp. and HP signed an agreement valued at \$50 million over five years to sell ruggedized versions of the HP Apollo Series 10000 personal supercomputer.

Cyberchron, which specializes in ruggedizing computer systems, will ruggedize the Apollo RISC-based Series 10000 allowing the system to

operate reliably under severe environmental conditions.

The system will maintain complete software and hardware compatibility with its commercial counterpart and will be fully supported by HP.

The ruggedized Series 10000 is \$70,000 for a base configuration, which includes 16 MB of main memory and 700-MB disk.



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You get fast file transfer, graphics emulation, background processing, keyboard remapping, and a powerful command language for automating repetitive tasks. PC or Macintosh, you'll feel right at home with Reflection.

Transfer files from host to LAN server in just a few keystrokes at your PC. Our

Reflection Network Series will help you get it all together: HP 3000, VAX, UNIX, IBM PC, Mac, Novell and 3 Com LANs. Switch from TCP/IP, LAT, or NS/VT sessions to a Novell or 3Com Network without rebooting your PC.

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CIRCLE 146 ON READER CARD

See us at ICMS Booth #212

Epoch's Renaissance Ported To HP, MIPS

Software Runs On HP 9000 Series 300

Epoch Systems announced joint marketing agreements to port its Renaissance distributed storage management applications to HP and MIPS computer systems.

The agreement with HP enables Renaissance to run on the HP Series 9000/300 under the HP-UX operating system. Epoch Systems will participate in HP's third-party marketing programs that provide sales and marketing activities involving both companies' sales forces.

HP's Model 20 GB/A Optical Storage Library Unit will provide 20 GB to 40 GB of centralized storage for Renaissance clients.

The agreement with MIPS will make Renaissance available early next year for MIPS' binary compatible line of RISCcomputers and RISCstations running the RISC/os operating system. Contact Epoch Systems Inc., 8 Technology Dr., Westborough, MA 01581; (508) 836-4300.

Circle 399 on reader card

HP Ships 25-MHz MC68040-Based Systems

*Also Introduces Model 425s
And Extends 40Plus Program*

Hewlett-Packard announced it has begun volume shipments of 25-MHz MC68040-based workstations, including a new Model 425s. HP also is offering an unlimited extension of its 40Plus Program, which originally was scheduled to end December 31, 1990.

The 40Plus Program provides HP Motorola-based workstation performance of more than 40 mips to all customers who purchase an HP Apollo 9000 Series 400 system.

The new HP 9000 model 425s is the expandable version of the desktop Model 425t and offers users increased memory, I/O and mass storage capabilities in a deskside configuration.

Models 425t, 425s and all 25-MHz MC68040 upgrades provide competitive CPU and graphics performance, immediate access to more than 3,200 applications and 100 percent compatibility with existing MC68000 workstations.

The Model 425t offers up to 22.1 mips, 2.6 mflops and starts at \$8,990. The Model 425s delivers up to 22.1 mips, 2.9 mflops and sells for less than \$14,000.

All Series 400 workstations are compatible with the HP Apollo 9000 VRX graphics systems and run Domain/OS and HP-UX operating systems.

Unify, Sybase Sign Joint Sales, Support Agreement

*Team Delivers UNIX Software
For Client-Server, OLTP*

Unify Corp. and Sybase Inc. signed a cooperative sales and support agreement to deliver a high-performance software development environment for a wide variety of client-server and online transaction processing needs.

Under terms of the agreement, both firms will directly sell and support a tailored client-server version of Unify's ACCELL/SQL high-performance 4GL application development toolset. Unify's new ACCELL/SQL for SQL Server product is an open systems 4GL front-end devel-

opment toolset for improving client-server applications development with the Sybase SQL Server RDBMS.

Prices for ACCELL/SQL for SQL Server range from \$1,770 to \$251,625 depending on hardware configuration and number of users. It supports all leading UNIX databases and user interfaces and runs on more than 170 different hardware platforms.

Contact Unify Corp., 3870 Rosin Ct., Sacramento, CA 95834; (916) 920-9092.

Circle 397 on reader card

HP Expands Toner-Cartridge Recycling Program Nationwide

Five-Month Test Completed In 11 States

HP announced the expansion of its toner-cartridge recycling program throughout the United States after a five-month test in 11 states.

The program was introduced to help reduce the volume of plastic in landfills. Customers are encouraged to ship their empty HP LaserJet printer toner cartridges to a central location at no cost. In turn, the National Wildlife Federation and The Nature Conservancy share a \$1 donation from HP's cartridge vendor for every unit returned through this program.

As of November 5, 1990, \$23,570.50 had been donated to each organization.

The cartridges are disas-

sembled upon return to the recycling center. Some parts are reused in the manufacture of new toner cartridges; the aluminum drum and other parts are melted and recycled as raw material.

To return a cartridge, customers may obtain a free recycling kit from participating dealers. The kit includes instructions for repackaging the cartridge and a prepaid UPS shipping label. The kit also is available by calling HP's Customer Information Center at (800) 752-0900 and asking for part 5952-2368. Eligible cartridges bear the following HP part numbers: 92295A, 92285A and 92275A.

Rewritable Optical Drives for Hewlett-Packard Computers with HP-IB Interface

Set Your Sights on Optical – 650MB in One Small Cartridge



Model 7600 Rewritable Magneto-Optical Disk Drive

- ▼ Huge 650MB capacity per compact cartridge
- ▼ Quick, random access to large amounts of data
- ▼ Convenient, removable 5.25 inch cartridge
- ▼ Perfect for high security – take it with you or lock it up
- ▼ Increase capacity by adding a cartridge
- ▼ Economical archival storage with "online" accessibility
- ▼ Very rugged and easily transportable
- ▼ Easily installed, uncomplicated to use
- ▼ Very reliable (head crashes are impossible)
- ▼ Long-life media (10-year minimum)
- ▼ No periodic media reconditioning required
- ▼ Available for HP 9000, 3000, and 1000 computers

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CIRCLE 106 ON READER CARD

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are trademarks of Hewlett-Packard
Company, Inc.

HP Signs IISI As Systems Integrator

Focuses On MPE, MPE XL, HP-UX

Innovative Information Systems Inc. (IISI) signed a systems integrator agreement with HP.

As a provider of strategic information planning, system design, programming and networking/communication services to Hewlett-Packard users nationwide, IISI joins organizations such as Ernst

and Young and EDS as part of the Systems Integrator program.

IISI's primary focus is on MPE, MPE XL and HP-UX commercial applications. As systems integrators, IISI worked with HP and other vendors in cooperative processing, PC integration, and NewWave development.

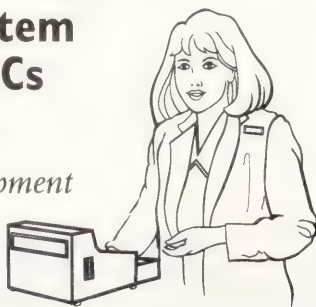
Point-Of-Sale System Uses HP Vectra PCs

*Convenience Stores Profit
From Easy-To-Use Equipment*

HP announced that it will supply HP Vectra 386X PCs to TouchScreen Systems Inc. The Touch-Screen solution, known as C-Touch, is designed to capture customer demographics as well as inventory movement.

Before TouchScreen Systems developed the final point-of-sale (POS) software, United Dairy Farmers (UDF) evaluated the needs of its convenience store managers and incorporated many of their needs into the product design. UDF wanted the touchscreen-activated program to shorten and simplify employee training because turnover rates are typically high in convenience stores.

C-Touch reduces the need to memorize complex rules and procedures. It prompts a store clerk with options on the PC screen to



facilitate the sales process. In addition, UDF's touchscreen technology simplifies transactions by automatically identifying taxable or food stamp redeemable items when a purchase is made.

Another feature of C-Touch is the ability to record customer demographics, a capability not readily available with the convenience-store POS systems. The screen displays profile fields that enable the sales clerk to note the sex of the buyer, categorize the customer's age bracket and record a cash or credit transaction.

The information is stored, tabulated and used to generate sales summaries. This data helps to increase the company's ability to merchandise products to its target customers.

For Your Information

■ Crisis Computer Corp. broadened terms on spares rental and repair warranties to enhance its customer service. Crisis offered annual and contract term spares rental kits to help reduce parts acquisition costs. On board-level products, the basic warranty has been increased from 90 days to one year. (800) 729-0729.

■ Visionary Design Systems joined with HP to become a value-added-reseller of HP's mechanical CAD workstations and software. (415) 940-4365.

■ Advanced Systems Techniques received an award from MCBA Inc. (Glendale, CA) for being the No. 2 company in the U.S. providing MCBA software running on HP 3000/9000 computers incorporated within AST systems solutions.

■ Template Graphics Soft-

ware Inc. (TGS) announced a series of hands-on PHIGS training courses to take place during 1991 at MIPS Computer Systems Inc. in Sunnyvale, CA. (619) 632-5339.

■ HP announced that it signed a contract with the Paging Products Division of Motorola Inc. (Boyton Beach, FL) for the purchase of 15 seats of HP's microwave-design-system software for workstations. The system is used to design amplifiers, mixers, limiters, multipliers and oscillators in the RF and microwave-frequency range.

■ The TECS Group, Technical Education through Computer Service introduced a CAD training video for ME 10 software. Tapes introduce the overall system, cover software concepts and operation, and discuss general system and CAD usage. (717) 285-2817.

NLI And SCT Provide English Access To RDBMS

*New Query Tool Based On NLI Technology
Offered To Higher Education*

Natural Language Inc. (NLI) and Systems & Computer Technology (SCT) announced that IntelliQuest, SCT's English access querying tool for the BANNER System, is based on NLI's Natural Language.

The BANNER Series is SCT's student, finance, alumni/development, human resources, and financial aid administrative database system

for the higher education market. It's written in SQL and uses relational database technology.

IntelliQuest is designed to enable non-technical end-users, such as deans, vice chancellors and college presidents to retrieve data from the BANNER System using English language queries. Contact Natural Language Inc., 2910 7th St., Berkley, CA 94710; (415) 841-3500.

Circle 400 on reader card

Backing Up With The TU81? Try This On For Size.



If you are backing up DEC equipment, you can add the speed and capacity of the 8mm standard in digital, helical scan tape backup. The industry's most advanced 8mm tape drive now interfaces to your TU/TA81 tape drive, your HSC tape channel, your DEC/VAXstation 3100 SCSI port, your Unibus, and your Q-Bus. **Digital, Helical Scan Technology.**

This compact 8mm tape with a 2.5-10 GB formatted capacity has revolutionized the way DEC sites handle the once cumbersome task of backup. Available in configurations to handle even the most data intensive sites, the CY-8200 makes unattended

True "Plug-And-Play" Capability With:

Alliant	DEC 3100	IBM S/36	Pertec
Alpha Micro	DEC HSC	IBM AS/400	Plexus
Altos	DEC Q-Bus	Macintosh	Prime
Apollo	DEC TU/TA81	NCR	Pyramid
Arix	DEC Unibus	Novell	Sequent
AT&T	Gould	PC 386/ix	Sun
Convergent	HP	PC MS-DOS	Unisys
Data General	IBM RT	PC Xenix/Unix	Wang

...and more

2-Line, 40-Column Drive Status

Display. Don't play guessing games – this tape drive tells you what you need to know. A 2-line, 40-column LCD gives you complete drive status information. At a glance you know what command is being executed, how fast the data is being transferred, how much tape is remaining, and what condition that tape is in.

From the Leader in 8mm Backup. During the past three years, Contemporary Cybernetics Group has ported the 8mm tape drive to more platforms than the next three vendors combined. We have the in-house engineering expertise to support you after the sale. The CY-8200 is covered by a full twelve month warranty including telephone technical support. And our standard warranty turnaround time is one to five days – not weeks or months.

If this sounds like the perfect fit, call us for complete details on the CY-8200 at (804) 873-0900.

CONTEMPORARY
CYBERNETICS
Group



backup a reality. Savings in media and storage costs, and savings in time babysitting a tape drive make this subsystem a very nice fit for your budget.

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CIRCLE 112 ON READER CARD

International Insights

HP Releases ISDN Products In France

*Access Products Offer
Transparent Integration For TCP/IP Users*

In France, HP released the first versions of two ISDN (Integrated Services Digital Network) access products, one for LANs and one for PCs, which integrate with industry standard networking in the form of TCP/IP. France is the leader in ISDN use worldwide.

The most notable features offered by HP ISDN Server and HP ISDN Link/MS-DOS are transparent integration with TCP/IP for users and network managers, support of LAN Manager, and flexible bandwidth allocation from one to six 64-Kbps ISDN channels.

HP ISDN Server attaches to both an Ethernet LAN and ISDN network, providing ISDN connectivity by routing TCP/IP packets between the LAN and ISDN switched circuits. HP counts three benefits for providing ISDN connectivity via TCP/IP.

Application transparency: No modification is required to applications that already run on TCP/IP and Ethernet networking protocols.

"This was not available before we announced our products. What you had to do before was develop a specific application for accessing ISDN, and you had to redo the access to ISDN for each application," says Benoit Sarazin, worldwide ISDN product line manager, HP

Grenoble.

Network transparency:

The two products act as another IP node and extend the TCP/IP networking capabilities to the ISDN without requiring modification to other IP nodes on the network.

Multivendor communications:

The ISDN connectivity the two products offer for the HP 3000 and HP 9000 extends to non-HP computers, as long as those computers support TCP/IP networking. The flexible bandwidth allocation found in HP ISDN Server is important for users who need to transmit large files of, for example, image data, on an infrequent basis.

HP Server has central network management capability via an OpenView Network Node Manager Server, and remote management capability via any system in the network that supports Telnet and TCP/IP.

HP ISDN Link/MS-DOS, by supporting HP LAN Manager and HP ARPA Services 2.0/MS-DOS, allows users to run over ISDN existing applications developed with LAN Manager, ARPA Services and Berkeley Sockets.

The two products are certified for use on the AT&T 5ESS switch, so they can work on most ISDN lines in the U.S. today, but the release date for the U.S. has yet to be determined, Sarazin says.

The products are initially

available only in France for 175,000FF for HP ISDN server and 24,500FF for HP ISDN Link/MS-DOS (the rate is about 5FF to the U.S. dollar), but are scheduled to be released worldwide in phases, as

they accommodate the various ISDN access protocols in each country. Next to be released will be Germany, U.K., Italy and Finland.

—Marsha Johnston, International Editor

Canadian Airlines Purchases HP Vectra PCs To Certify Pilots

CBT Program Saves \$15 Million

Canadian Airlines International Limited (CAIL) purchased 81 HP Vectra RS/25C PCs to use in its training program to certify pilots and mechanics.

The PCs and flight-simulation software comprised computer-based training (CBT) that replaced the current audio-visual exercise portion of the pilot-certification program.

The CBT program runs

over a NetWare network using high-performance Ethernet adapters from Cogent Data Technologies Inc. Cogent's E/MASTER adapters provide the high-data throughput needed to transfer the intensive graphics and digitized audio over the network cable.

The HP Vectra RS/25C PC runs software from Boeing and Wycat that uses the latest technologies in voice, video disk and touchscreen.

TAG Business, STT Swedish Telecom Develop FAX Integration

TAGfax/3000 Works With HP 3000 Systems

TAG Business Computing Ltd. (Leamington Spa, England) and STT Swedish Telecom (Basingstoke) announced a technology agreement for the development of FAX integration software for the HP 3000.

TAGfax/3000 is an add-on product designed to run under TAGswitch/3000, the multiple terminal software environment, that enables users to "hotkey" from any HP 3000 application, send FAX messages using a message creation

package, then return to the original application, where the screen is restored. Routines are transparent to existing applications.

Resend capability, full online inquiries, multiple destinations, and a preloaded forms definition for FAX text are amongst the features of TAGfax/3000.

Contact TAG Business Computing Ltd., 12 Clarendon Place, Leamington Spa, Warwickshire, England CV32 5QN; (0926) 883186.

Circle 371 on reader card

Introducing a new way to look at your world.

When it comes to software, good looks and a nice personality can go a long way.

That's why Collier-Jackson has developed a flexible screen management system for its World Class Series™ Accounting and Human Resource software.

Now you have the ability to customize your screens quickly and easily. This built-in capability lets you adapt our Accounting, Payroll and Personnel systems to your company and your changing needs...instead of the other way around.

Our new screen management system makes working with our software simpler, too. Convenient pop-up menus, combined with our proven express navigation and borderless integration, let users move from one application to another faster. And, if you ever have a question, Help windows are always ready to assist you.

The bottom line? Our Accounting and Human Resource systems now give you the best of all worlds. PC look and flexibility. Collier-Jackson effectiveness and functionality.

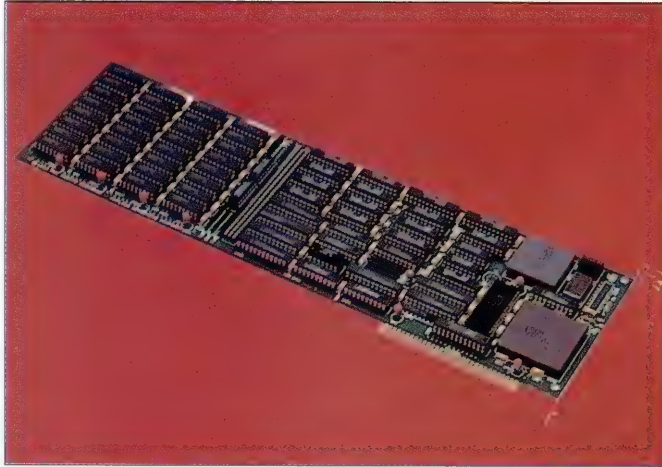
World Class Series software has never looked better. Find out more. Call us now at 813-872-9990.

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Going Up?



Put A 386 PC In Your Apollo Workstation With PC-ELEVATOR 386

Has your company migrated from the desktop PC running MS-DOS applications to the UNIX workstation environment? Would you like to regain access to those old favorite DOS engineering and graphics applications from your workstation?

You can have both the DOS and UNIX environments at your fingertips without sacrificing your workstation's speed by slipping PC-ELEVATOR 386 from Applied Reasoning (Cambridge, MA) under the hood of your workstation.

PC-ELEVATOR 386 is an 80386-powered coprocessing system that provides full PC compatibility for HP Apollo 9000 Series 400 workstations running HP-UX. It delivers 3.5 mips and a Norton Index of 18.7.

The PC-ELEVATOR 386 system includes an ISA-based expansion card with an onboard 16 MHz 80386 microprocessor, 1 MB of zero wait-state 32-bit DRAM, (additional expansion memory optional), and software

integrating DOS and UNIX systems environments. An optional 16 MHz 80387 Math Coprocessor also is available.

PC-ELEVATOR 386 may be installed on an Apollo workstation with an Industry Standard Architecture (ISA) or Extended Industry Standard Architecture (EISA) bus.

PC graphics standards are supported, including VGA, EGA, CGA and Hercules. DOS applications can access workstation peripherals, including keyboard, mouse, floppy disks, hard disks and network communications.

In addition, PC applications such as HP NewWave, AutoCAD, Microsoft Excel, Intergraph MicroStation and Aldus PageMaker can access workstation graphics systems directly for increased performance resolution. A ZOOM utility automatically selects larger or smaller text fonts for your display as you resize the window.

"We have boosted the range of PC-compatibility capabilities to the Apollo 9000 Series 400 platforms," says Dan Scherlis, president of Applied Reasoning. "By offering a 386-based product, we provide customers high-end DOS performance, full-screen graphics for major PC applications and support for protected-mode applications."

Once installed, PC-ELEVATOR 386 is invoked by a simple command. It creates a PC environment in a window on the workstation display. From PC-ELEVATOR 386, you can access UNIX system

resources network-wide including remote files, disks and printers. Optional remote capability allows access to PC-ELEVATOR 386 from any workstation on the network.

PC-ELEVATOR 386 includes full-screen, native graphics support for selected PC applications with optional driver software. Also, when you're in the PC window, you can use your Apollo mouse just as you would a Microsoft mouse on your PC.

If you could benefit by having DOS and UNIX co-exist in your Apollo workstation, consider PC-ELEVATOR 386. It offers you the functionality and flexibility of both operating systems without the performance and compatibility limitations of sharing a single CPU.

PC-ELEVATOR 386 with 1 MB of DRAM, software, and one year support is priced at \$1,990. PC-ELEVATOR 386 with an 80387 Math Coprocessor is priced at \$2,580.—George T. Frueh, Technical Editor

Applied Reasoning Corp.
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If programming in HP's Rocky Mountain BASIC is your bag, you'll be glad to hear that you now can turn your desktop PC into an HP 9000 Series 200/300 BASIC "speaking" workstation.

High Tech BASIC (HT-Basic) from TransEra Corp. runs on your IBM PC/XT/AT or PS/2 computer without the need of additional hardware and is compatible with HP's 9000 Series 200/300 Rocky Mountain BASIC.

HTBasic runs as an application under DOS. All of the features available under DOS are available to BASIC programs. These include the fast DOS hierarchical file system, extendable files, most popular DOS networking systems and DOS utilities.

HTBasic implements the full screen editing and debugging environment of HP BASIC. It supports Hercules, CGA, EGA, VGA and super VGA graphics displays, HP-GL plotters, and EPSON and HP-PCL printers.

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bit-mapped, and you can emulate a non-bit-mapped display with EGA and VGA display controllers by issuing the command SEPARATE ALPHA FROM GRAPHICS.

For scientific programming, HTBasic is on par with FORTRAN. It provides an array of statements, functions, and operators for handling complex numbers and expressions. Extensive math operations are also supported for the integer, real and complex data types, and an added math coprocessor will speed up math operations. HTBasic performs very well in Matrix Multiplication and scalar/matrix multiplication. Sub-array assignments make it possible to transfer part of an array to another subarray. Arrays can be sorted, recorded or searched.

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For engineering applications, the serial interface (RS-232C) driver incorporates an interrupt-driven receive buffer and software handshaking. The receive buffer accepts characters as they arrive, not just during an ENTER statement. Characters sent by instruments are accepted and saved in the buffer.

MSB FIRST and LSB FIRST options have been added to the ASSIGN statement so that data can be accepted or transmitted most- or least-significant byte first.

The DOS PC Version of HTBasic is priced at \$625 and provides 300 KB of user memory. It runs on all HP Vectras, IBM XT, AT and PS/2 PCs or compatibles running PC-DOS or MS-DOS.

The DOS 386 Version is priced at \$925 and supports up to 16 MB of extended memory and is for use on HP Vectra RS, QS, IBM PS/2 model 70, 55 or 80, or other 386, 386SX or 486 PCs running PC-DOS or MS-DOS.

A student version of HTBasic is also available. Intended for use in educational environments, the student version includes all the statements of the full version. Complex arithmetic, the Reference Manual HELP statement, a user's guide and Epson and HP-PCL graphics printer support are also provided, and all program and data files are directly compatible with the full version.

Additional software upgrades, hardware and supplementary items also are available.—George T. Frueh, Technical Editor

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PRIMITIVE OBJECTS

Emergent Object-Oriented Database Technology Could Be An Attractive Successor To The Relational Model

[BY BILL SHARP]

Object-oriented database systems have an interesting aura. They're manifestations of the full-circle rule. Everything goes back from whence it came. Cave-men communicated by drawing pictures, moving on to more complex scribbles only when they had concepts in their thick skulls that they could convey in no easier way. Even with computers to do much of the tough thinking for us, we're headed back to simpler things—pictures.

Pictures on cave walls and graphics stored in an object-oriented database may seem unrelated at first. But, in some ways, they're more alike than different. A pictogram scratched and smeared onto some sheltered outcropping of sandstone might show a bison pierced by a spear. To those who knew the "language," the picture might immediately have caused recollections of a hunt, the people in the hunt, weapons used, injuries to hunters or the food supply that season.

The bison picture was, to its creators, a representation tied to a great deal of other information. Much of that information was simple data or facts about an animal or a hunt. Other information might have been of a process nature, such as a new hunting method commemorated by the drawing. Object-oriented data that



bases offer some of the same advantages as the bison pictogram without the bother of scratching on rocks or mixing paints.

However, the caveman analogy fails to adequately express a key point about object-oriented database management systems (ODBMS). An object includes not only data, but also information defining how that data can be used. This improvement promises to make databases far more powerful than rock paintings.

Computer-Simulated Business Information

TRYING TO BE LUCID in describing object-oriented databases is a challenge that can leave even the experts flustered at moments. "We almost don't have the vocabulary to express it," protests analyst Les Hellenack, director of new software technologies for International Data Corp. (Framingham, MA). "The thing that's really beautiful about the object world is that it captures the data structure that the thing is about, and is reusable and expandable."

HP's Doug Dedo, database product line manager for the Commercial Systems Division, prefers to define object databases

as "a computer simulation of the business information you work with," he says. "If you're working with employees, then an employee is your object and you want to simulate that in the computer as your unit of data."

An object-oriented database allows you to store employee functions or behaviors so you can use that data for any application without having to recreate or duplicate the data. Your employee object would encapsulate information on a given employee, including data on hiring, salary, vacation time, sick days, promotions, positions held, education and other facts. Whenever you promote this employee or send him to an off-site class, you will interact with this same "object" in the database.

"One-to-one modeling of the real world in the database is the major step forward that object-oriented databases represent," says Dedo. "You don't have to map your data into a structure that's at odds with the way you look at the world. It's easier to learn so training costs are less and you get higher-quality work."

So, are all your database problems solved forever? Nope. Fact is, the real world is just beginning to see applications for ODBMS. While the database industry is large and growing larger, the object portion of the market is still in its infancy. Hellenack points out

"The market for relational databases went from \$2 million in 1980 to \$2.5 billion in 1990. But the object market is a tiny \$10 million for now." He says it may grow rapidly depending on the performance of U.S. and international economies, perhaps reaching \$225 to \$250 million by mid-decade.

Object databases offer some strong incentives for people with appropriate needs, but the technology isn't "right" for everyone who craves a database, at least not for now. To make this more clear, here's an explanation of the different types of databases.

Database Paleontology

DATABASE EVOLUTION INCLUDES four overlapping families, each of which had its period of dominance over the computing landscape. After reigning for a time, each in turn receded into niche positions in the local electronic ecology. This technological succession isn't all that different from what takes place in the biological world, it's just faster.

File based or "flat file" data storage is the granddaddy method, predating databases. When you store your latest labors on your UNIX workstation, that stored data is a file. Simple PC applications do it this way. This isn't a terribly powerful or friendly method. It is, however, very simple and fast. Applications that demand the utmost in blinding speed for data storage and retrieval still rely on some kind of file storage. CAD/CAM applications typically use file storage because of their need to move very large amounts of information rapidly into and out of storage.

In file-based applications, most of the work is done by the application, the "code" itself, rather than by the data storage system. Only the act of file storage is handled by the storage system. User interface, program logic, data and file I/O functions all reside in the application (see *Figure 1*).

DBMS: Concurrent Access

NETWORK, ALSO CALLED hierarchical or codicil-type systems, were the first true database management systems (DBMS). The evolutionary advance these systems wrought is moving some of the work formerly done by the application into the database system. This includes how you define the database, its structure and what you call your data. Instead of a file system, DBMS systems have an access method for reaching data, and each type of DBMS has a unique access method—there were no industry standards at the time.

The good news is powerful database capabilities that allowed concurrent access to the database for the first time. Older systems made it possible to easily destroy data. This system placed a lock on the particular data during a transaction, while allowing transactions to take place elsewhere in the database.

The bad news is that DBMS leaves user interface, program logic and access under the application's control. This means each

application or vendor uses different access methods, so moving data from one system to another, as in long distance heterogeneous networking, is very difficult. Still, lots of these systems are around, doing important work and safeguarding data. Some DBMS products include IBM's IMS, DEC's DBMS and, of course, HP's IMAGE.

RDBMS: Current King

RELATIONAL DATABASE MANAGEMENT systems (RDBMS) are the next step up in giving database systems improved data handling power. These systems are the current kings of database land, growing rapidly as more and more applications move to this type of data storage from earlier systems. At this level, a couple of important advances show up. One is the emergence of the SQL, providing an industry standard access method for all RDBMS systems. This is possible because the access method functional block has been moved from the application software and transformed into a database function (see *Figure 1*).

Contrary to what its name implies, a second advance for relational databases is the lack of proscribed relationships between different elements of data in the database. RDBMS allows you to go back to your database and study relationships you didn't plan to explore when you originally entered the data. Hierarchical/Network/Codicil DBMS systems, by comparison, restrict the database to applications that use the data in the same manner planned during data entry. Relational databases are particularly good for online transaction processing (OLTP) applications, and management-level use of data to study the behavior of organizations or whole corporations.

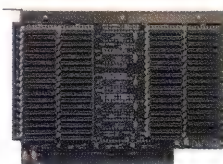
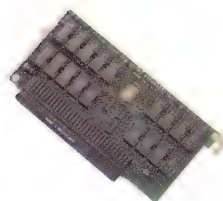
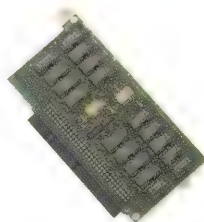
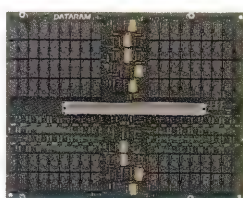
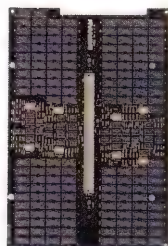
Relational databases also make it easier to set up distributed database systems that move information to and from multiple locations. Using relational systems, says HP's Dedo, "You can pull information from different functional groups and you don't have to care where the information is. You can have access to it just as if it's all in one place. This is very important for distributed organizations. You want to make the complexity of the system invisible to the user."

Examples of vendors and their RDBMS products include IBM/DB2, DEC/rdb, HP/ALLBASE, Oracle/RDBMS, ASK-Ingres/Relational Database and Informix/Informix-SQL.

ODBMS: Impatient Prince?

There's a temptation to view ODBMS as the next grand and glorious database thing (NGGDT). Someday it probably will be, but that day is several years off. For now, ODBMS isn't an NGGDT, but an infant with tremendous promise. As an infant, object technology can't immediately displace DBMS and RDBMS for all applications. What it can do is move into some applications that can take advantage of the unique new capabili-

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ties of object databases, applications that now function poorly or not at all using other database models.

In general, object databases won't be a panacea for people who crave blinding speed. As you move to the right in *Figure 1* the systems gain ability to handle complex problems, and lose execution speed. What object databases do offer are much improved capabilities to deal with complex database needs. The object encapsulation concept provides this. In addition, because the user interface now resides in the database, the system can be consistent, easier-to-use and more intuitive. Only the program logic itself still resides in the application. The other database-related functions all have migrated into the database.

Several computer applications practically beg for object-oriented databases to reduce their complexity to a level that typical users will tolerate. These include applications in areas such as expert and knowledge-based systems, massive new telecommunications systems, as well as geographic and mapping systems.

Dedo sees companies with multiple functions dependent on the same geographic database as a good example of where object databases can make a large contribution. "Gas utilities, communications companies, trucking firms and package moving companies all have a geographic basis for their information systems," he says. "They use different applications for each of several functions such as distribution, cost optimization and maintenance. If you can put this geographic data in an object database, you don't have to recreate that database for each application."

Another big advantage to object databases is the comparative ease with which they can work with different types of data. Relational systems can pull in foreign data types, but they don't know what kind of data it is, and can't adapt to treat the data appropriately. For instance, a relational database won't know if a

blob file is voice or textual data, and won't know whether to print that data out or to play it on your system's speakers. An object database knows what to do with the data because understanding data form and function is part of the encapsulated object.

Says Dedo, "Most benefits of object databases come from being able to do things we can do today, but that are typically too expensive to implement broadly using other databases. Object makes it less costly to implement complex applications."

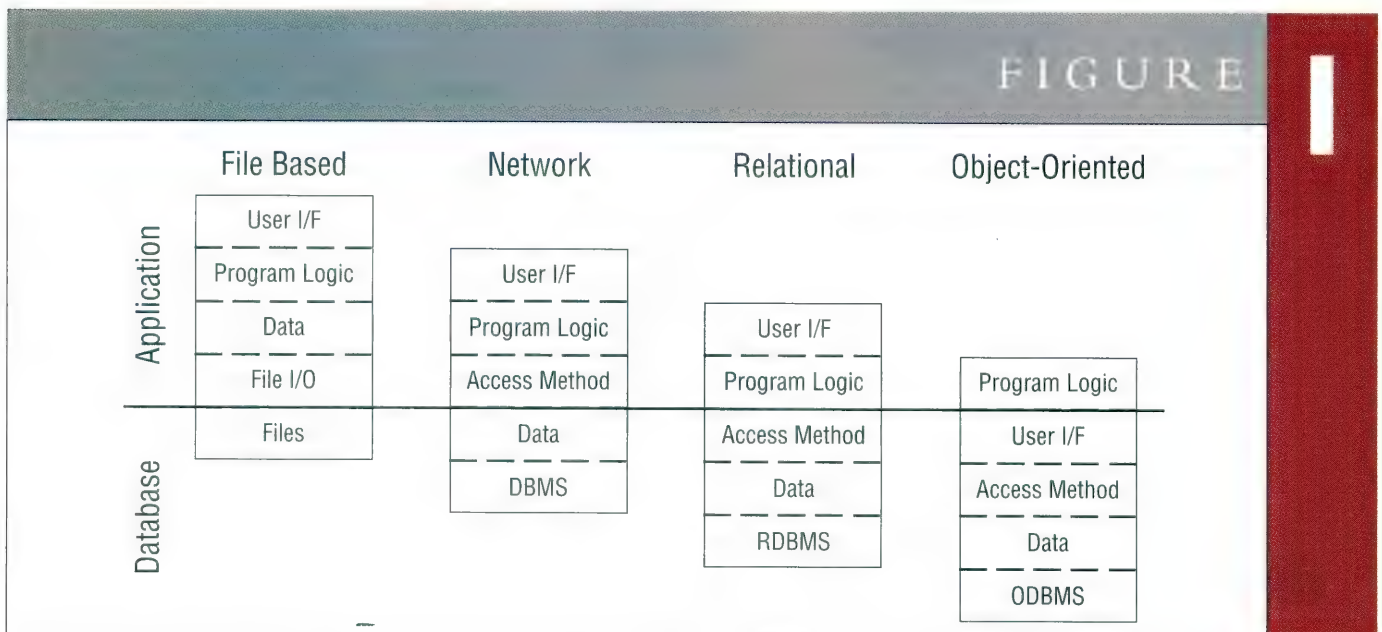
Example ODBMS vendors include Objectivity/Objectivity DB, Ontologic/ONTOS object database management system, Itasca Systems/ITASCA distributed object-oriented database management, Object Databases/G-Base and of course HP. Other vendors can be expected to take part as well.

Who Benefits?

SIGNIFICANT TECHNICAL ADVANCES happen in part because everybody gains something by adopting them. Object-oriented databases are no exception. We've seen what benefits end users will derive from object databases. What about systems vendors and application developers? How do they benefit from using ODBMS?

Systems vendors face an inexorable spiraling in system complexity. They must provide systems with more power, more memory, improved user interfaces and networking systems. Object-oriented databases make much of this easier to use, cutting down on the apparent complexity faced by users.

Software developers gain in even more tangible ways. Look at *Figure 1* again. What's above the line in the application, is what the developer has to create, debug and maintain. What's below



Each generation of database technology integrates more of the application environment into the database.

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the line is part of the database, representing far less of a problem to the developer. Object databases reduce the developer's task to a minimum. In fact, the database portion of a software application can be reused with other applications, saving tremendous duplication of effort. Dedo notes that with a 3GL such as COBOL, 80 percent of each new application is newly generated code. With object-oriented applications he says, new code drops to about 20 percent of the application.

Ready To Jump?

S O ODBMSs ARE A SMALL but rapidly growing family of solutions that offer increased capability for dealing with complex systems and providing increased ease of use. Real nifty, but do they come in more than one flavor? Did you expect this to be simple? There are three basic ODBMS flavors, each representing a different method of building the database.

■ **Blueberry bandaid.** This is really a relational database with object-oriented add-ons to give you some advantages of an ODBMS, but it gets to market sooner than others. ASK/Ingres, Informix and probably Oracle and HP as well, all will offer this type. For many, this is as far as they'll need to run in the direction of object systems any time soon. However, notes Dedo, because the system still uses a RDBMS data structure, there's a limit to application flexibility because it isn't a true object-based system.

■ **Raspberry roll-your-own.** Here we have the solution for the rugged individualist who insists on tramping ahead into the unknown, blazing new trails in the wilderness. You get one of the new, snazzy versions of an object-oriented programming language such as C++ or Smalltalk and start programming.

Designing an object-oriented database requires considerable development work and is appropriate mostly for specialized applications. By eliminating some of the capabilities such as concurrent access, a home-grown system with very high access speeds could be produced for applications like CAD/CAM. Several companies offer the tools needed to roll your own, including HP. However, you should note that the custom system you create is unlikely to link well with existing RDBMS systems.

■ **Grape from the ground up (mostly).** Purists who insist on going the whole distance, or who need all the capabilities of an ODBMS, will go for the grape. This is a "pure" object-oriented database, retaining only the core storage portion of the relational design, but using objects rather than the rows and columns of relational data. If you must have the capability to deal with complex data types and want to take full advantage of the object concept, then you will need to go with this choice.

HP began toying with object-oriented programming in the early 80s, and started its Iris object-oriented database program in 1984 at HP Labs in Palo Alto, CA. That early work was highly regarded within the research community and was turned over to HP's Commercial Systems Division for product development.

Observers have at times wondered if HP is serious about de-

veloping Iris into a product, but Dedo has no doubts. "Our plan is to make it available next year to premier developers to help expedite bringing a complete solution to market," he says. The developers will help HP produce development tools for use with the core database. "With development release next year, that means we'll have a product nine to 12 months later," he says.

Although HP won't be the first to market its "pure grape" object system, Dedo believes, "It will be a much higher class of solution than anybody else is producing in an object database." meanwhile, HP will offer C++ development products, and object extensions to its relational product, HP ALLBASE.

HP says look before you leap to an ODBMS, but then HP doesn't have much for you to leap to—yet. Just the same, Dedo's cautions make good sense for objectwatchers. "This isn't a better OLTP mousetrap," he says. "Object databases were created to satisfy needs that haven't been resolved well with today's technologies. Don't switch to object if relational does the job well today."

For those intent on making the change: Look at the full cost of ownership (not just the purchase price) for solving your problem with current technology versus solving it with an object-oriented system. Making the change isn't worth it unless and until the savings are significant enough to more than compensate for the disruption caused by the shift.

Early adopters of object databases are likely software developers who reap the benefits of reduced code generation and maintenance costs, as well as large-scale users with complex systems already taxed to the limit. Object databases won't immediately replace other systems on the market. Expect slow, steady growth in the market as more users gradually find it advantageous to ogle object as the system of choice.

The world is coming full circle to pictures again, but various database types will persist for years to come, each optimized to serve specific needs. In the case of relational and object, they'll often be working together. For the time being, relational and object databases will share the evolving database marketplace, and let bison be bison.

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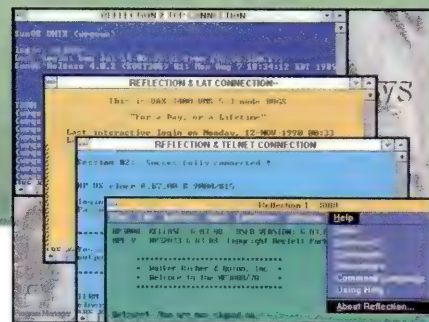
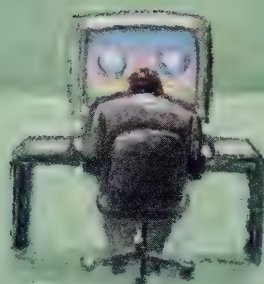
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HP's Data Management Strategy Covers All Bases

From a data-management perspective, users in a networked environment are usually looking for an open systems database solution that delivers high performance and data integrity for online transaction processing (OLTP) applications.

Users have recognized that a true open systems environment, which HP defines as a set of networked heterogeneous computers working together as a single integrated whole, is essential for interoperability and application portability. Interoperability allows users to mix and match heterogeneous products, selecting the best solution for each function. Portability allows users to move their source code between platforms, so they can take advantage of the best systems in the industry.

Finally, the robustness of the database engine and the ability to build data integrity into the back-end database is particularly important in a networked environment. Here, it's much more difficult to ensure that every developer understands the rules for pro-

tecting the database from corruption and inconsistencies. Data integrity rules are best implemented in the database kernel rather than in each application, and no user or application should be able to circumvent the rules.

HP's commitment to open-systems solutions is supported by a data management strategy that focuses on the several goals.

- To provide interoperability, standards, performance and data integrity with HP's relational database, HP ALLBASE/SQL.
- To provide application portability by supporting leading multivendor development environments and 4GL tools with HP ALLBASE/SQL.
- To enhance and allow relational coexistence with HP's robust TurboIMAGE database-management system.
- To provide "best in class" databases from independent software vendors (ISVs).

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BY RAJOO NAGAR

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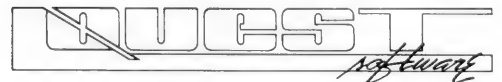
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ing program, which is based on open-systems solutions and a standardized approach to client-server computing. With NewWave Computing, users can create networks of heterogeneous hardware and software systems that work together in an open client-server environment to make information and computing resources easier to find, share, use and manage.

To achieve this, HP is focusing on delivering data management and networking products compatible with its NewWave Computing strategy. NewWave Computing is based on the following underlying principles, which impact database technology:

- Standards-based distributed processing.
- Heterogeneous, multivendor systems.
- Distributed support extensions coexisting with local operating systems.
- Client-server and peer-to-peer interactions.
- Object orientation for applications and systems.
- Coexistence with traditional, terminal based solutions.

HP's Database Offerings

HP TURBOIMAGE IS ONE of the most widely used, high-performance network database management systems for OLTP applications in the industry. It is a core product for HP 3000 systems, and HP continues to support and enhance HP TurboIMAGE with performance improvements and new functionality. Future planned enhancements to the

TurboIMAGE include generic key search, support of IEEE floating point data types, critical item update and continuous performance tuning.

HP TurboIMAGE databases can be accessed by a variety of multivendor 4GL and decision-support tools, such as offerings from Cognos, Infocentre and Ingres, and HP's NewWave Access product, which allows access to HP TurboIMAGE data from PC-based HP NewWave applications.

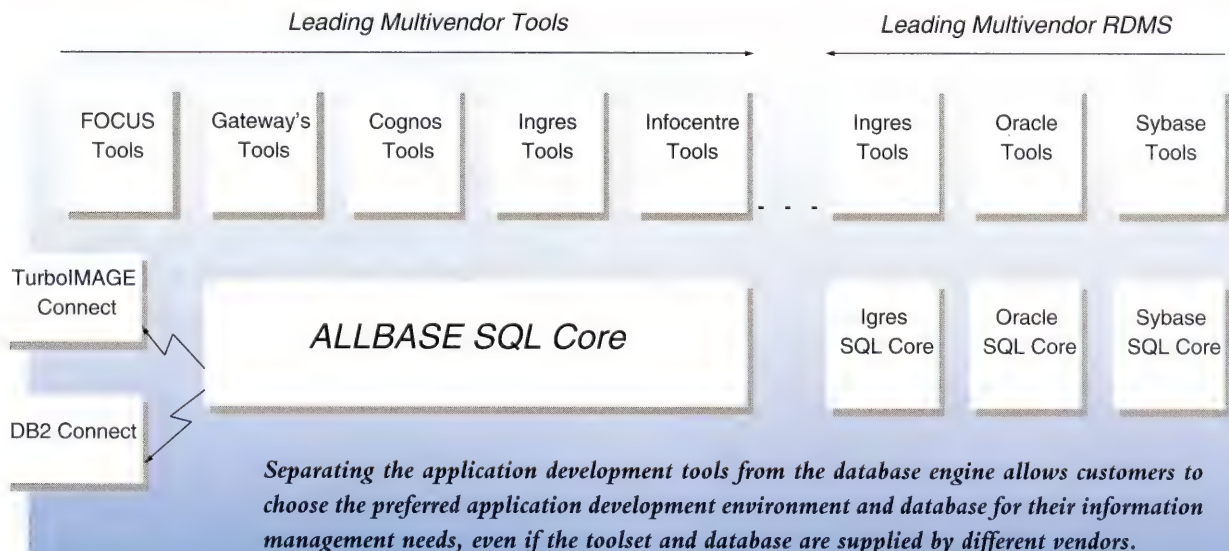
HP also offers a broad range of data-management solutions for networked environments. HP ALLBASE/SQL is HP's high performance, open RDBMS available on HP 3000/9000s.

Based on the industry-standard ANSI SQL, HP ALLBASE/SQL currently conforms to the ANSI SQL 1 standard and is X/OPEN*XPG3-compliant. It will be extended to conform to the ANSI SQL 2 standard and X/OPEN*XPG4 SQL specifications. The RDBMS has been optimized and tuned for the HP 3000 Model 900 operating system (OS), and underlying PA-RISC architecture. This is because high OLTP performance can be most effectively and quickly delivered through a close coupling of the database and system software. HP ALLBASE/SQL is also a strong performer on the HP 9000 systems.

At the same time, support for mission-critical OLTP applications can be most effectively delivered if the database and operating systems are supported by HP's own integrated support structure. This results in superior supportability and data integrity for the customer and is one of the primary reasons why HP has chosen to invest in its own RDBMS solution.

Performance is a key strength of HP ALLBASE/SQL. In ad-

FIGURE



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dition to being tightly integrated with the operating systems, the database engine has been enhanced to offer superior performance. Some notable enhancements include path-length tuning, hash indexing for fast access, optimizer improvements, support for Raw I/O on HP-UX, faster interprocess communication between the front-end and back-end, multiprocessor support, and new sort algorithms that improve performance significantly. New functionality also has been added to provide better application performance with third-party application development tools.

HP ALLBASE/SQL provides for referential integrity checks in the database. Integrity constraints allow users to check data integrity at the schema level, rather than coding complex checks in application programs. In addition to simplifying the work of coding, this leads to improved performance. Referential integrity in HP ALLBASE/SQL is implemented using primary and foreign keys, and conforms to ANSI SQL1 Level 1 Addendum.

Online backup, automatic log switching, and using dual logs provide nearly continuous access to HP ALLBASE/SQL data. Online backup is a process whereby a backup takes place without bringing down the database system. At a later stage, a log file can be applied to the archived database copy, bringing the database to a consistent state. With the automatic log-switch enhancement, switching to a new log will be done automatically while backup is in progress. The dual log option results in the second log being automatically invoked by the RDBMS if the first log becomes damaged, thereby ensuring maximum availability to users.

Multivendor Tools Integration

HP ALLBASE/SQL IS COMPATIBLE with several industry-leading multivendor application development and decision support tools. Applications developed using these toolsets will be able to run on HP ALLBASE/SQL, or on other databases supported by the tools with little or no modification.

The separation of application development tools from the database engine is a trend that's beginning to gain momentum in the relational DBMS market. HP has responded by providing linkages of popular multivendor 4GLs to HP ALLBASE/SQL. For example, Cognos' Powerhouse, Ingres' Application By Forms (ABF), Information Builders' FOCUS and Infocentre's Speedware 4GL tools all support access to HP ALLBASE/SQL on HP 3000 and 9000 systems (see *Figure 1*).

The Cognos and Ingres application development toolsets provide compatibility across a variety of platforms such as HP, DEC, IBM and UNIX-based systems. FOCUS is a 4GL application development and report-writing tool dominant in the mainframe market, but it is also available for PCs and midrange systems. HP's strategy is to continue to increase the 4GL solutions available with HP ALLBASE/SQL.

Separating the application development tools from the database engine allows customers to choose the preferred application development environment and database for their information management needs, even if the toolset and database are supplied by different vendors. It also gives customers the flexibility to mix and match front-end toolsets with back-end database engines. HP's strategy for HP ALLBASE/SQL is to provide a high performing, robust back-end database server through tight integration with the OS; with application portability and interoperability being achieved through multivendor tools integration and industry-standard interfaces.

Industry standards organizations support the trend toward database and tools separation by promoting a standard application programming interface and standard network protocols. Such standards help guarantee users have ability to mix and match heterogeneous SQL products on multivendor platforms.

HP ALLBASE Access Products: Removing Connectivity Barriers

HP OFFERS CONNECTIVITY PRODUCTS that allow access to foreign databases from HP ALLBASE/SQL, or enable remote peer-to-peer and client-server connectivity between HP ALLBASE/SQL databases on a network.

HP ALLBASE/NET is a network interface that facilitates peer-to-peer and client-server communication between HP ALLBASE/SQL data and applications on a LAN or wide area network. HP ALLBASE/NET allows an application executing on a front-end HP 3000 or HP 9000 client to transparently access (read/write) HP ALLBASE/SQL tables residing on a back-end HP 3000 or HP 9000 server. No special linking is required to create applications that can access a remote database. HP ALLBASE/NET supports transparent remote access to HP ALLBASE/SQL from third-party tools. Access from user-written preprocessed applications and HP ALLBASE tools also is supported.

HP ALLBASE/Turbo CONNECT (ATC) provides investment protection for the HP 3000 customer who has developed an application strategy on HP TurboIMAGE. ATC provides transparent read access to HP TurboIMAGE databases from any HP ALLBASE/SQL application. Users can access HP TurboIMAGE data on remote HP 3000 systems from SQL applications executing on HP 3000 or 9000 systems.

ATC also allows customers to begin new application development using a relational database while protecting existing investments in their HP TurboIMAGE database. By providing a link between them and a common user interface and tools, HP has made it possible for the two databases to coexist in the same environment. New SQL applications may be written using either 4GL or 3GL tools, and HP provides a choice of several multivendor 4GL tools that support both databases.

HP ALLBASE/DB2 Connect represents another aspect of HP's data integration strategy. It's an HP 3000 software product that

allows data integration in networked HP and IBM environments. HP ALLBASE/DB2 Connect allows database administrators (DBAs), application developers, and decision support users running on an HP 3000 Model 900 RISC-based system to transparently create, read, modify, and update information in a DB2 database on an IBM MVS mainframe. Data can be up-loaded from one environment to the other, allowing complete flexibility in managing mixed environments.

HP NewWave Access software integrates PC, minicomputer or mainframe data into desktop applications. It builds on the HP NewWave environment by including links to external data sources such as HP ALLBASE/SQL, Oracle, DB2, HP TurboIMAGE, dBASE and R:BASE. The software is designed for decision-support environments in which users require rapid access to database information. It provides a simplified process for incorporating database information into decision-support applications, documents and communications.

HP NewWave Access outputs data to PC file formats such as dBASE, R:BASE, Lotus 1-2-3, SYLK, DIF, ASCII, and remote database and file formats. Remote data is represented as local "data view" objects in HP NewWave. With this approach, users can make use of database information without programming or learning complicated database syntax.

The use of 4GLs for client-server application development is

still an emerging area. HP hopes to be a leader here by providing the best database solutions for client-server applications. For example, HP recently started development of a client-server interface to HP ALLBASE/SQL. This will allow end-users greater functionality, flexibility and ease of use. This product will be initially offered to VABs this year, and then to the general application development market. HP's longer term plan for client-server functionality in ALLBASE/SQL is to comply with the standard interfaces still being defined.

Interoperability Via Standards

THE ADVENT OF DISTRIBUTED and client-server computing has created a whole new set of challenges for MIS managers, hardware vendors, software developers and, ultimately, the end user community. One major challenge is the need to manage information scattered across an organization in different RDBMSs. Today, although communicating across various platforms is possible, intervender SQL interoperability — the ability to access and write applications on different RDBMSs — still isn't possible. Clearly true client-server computing can't be accomplished until users can access data from different RDBMSs and hardware platforms. Also,

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without the ability to mix and match clients and servers, users are limited in their choice of RDBMSs and application tools.

To encourage the adoption of industry standards for client-server computing and database interoperability, HP helped form the SQL Access Group. Other members include computer vendors such as DEC, Sun and Tandem, and relational database suppliers such as Informix, Ingres, Oracle and Sybase. The SQL Access Group also has X/OPEN*representation.

The mission of the SQL Access Group is to develop a technical specification that will allow SQL-based relational databases and tools from multiple vendors to work together in a standalone or networked heterogeneous environment. The SQL Access Group is working with standards organizations such as ISO/RDA, ANSI and X/OPEN*to provide an interoperability solution for customers that wish to link different SQL databases running on different machines through standardized queries. In the future, users will be free to mix and match SQL Access-compliant products to meet their information management needs.

As a founding member and active producing member, HP is committed to the SQL Access standard and is helping to drive the specification for a standard application programming interface (API) and network protocol. SQL Access compliance will be provided with ALLBASE/SQL in the near future, allowing

interoperability between it and other relational DBMSs that conform to the SQL Access standard.

HP's recommendation to HP 3000 customers is to continue using HP TurboIMAGE if it satisfies their current application needs. HP TurboIMAGE remains a highly effective solution for OLTP applications.

For customers developing new applications, interested in client-server capabilities, or likely to move toward a distributed environment, HP ALLBASE/SQL best meets their needs. In addition to offering all the benefits of relational technology, HP ALLBASE/SQL is more than capable of handling high-performance OLTP applications. Customers developing on HP ALLBASE/SQL also have the option to coexist with HP TurboIMAGE databases, via the HP ALLBASE/Turbo CONNECT product.

With the availability of multivendor tools and applications and client-server functionality on the horizon, ALLBASE/SQL is a very attractive offering that satisfies customer needs for high performance, data integrity, and openness in a networked environment. —*Rajoo Nagar is an HP ALLBASE/SQL product manager for HP's Computer Systems Group, Cupertino, CA.*

Would you like to continue to see articles on this topic?

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[AN OPEN LETTER]

Editor's Note: The following letter was prepared by HP for distribution to the TurboIMAGE special-interest group of the Interex user association.

Hewlett-Packard is fully committed to supporting and enhancing the TurboIMAGE database. In fact, HP has publicly announced that it will support TurboIMAGE into the 21st century. I would like to share with you some of the recent and planned TurboIMAGE-related product enhancements. I think that reviewing these helps put our product efforts into perspective.

Ongoing (All Releases)

- Performance Scalability.
- Bug fixes.

MPE/V Release 20

- MUSTRECOVER enhancement to the Recovery Process.
- Multiple database transactions

MPE/XL Release 2.1

- Overall performance improvement of 25-35 percent.

Part of this was done through:

- Using Mapped File Access for all datasets shortening the path length and reducing main memory usage.
- Converting DBRECOV Utility to native mode.
- User logging in native mode.
- Optimizing DBUPDATE logging.
- Reducing database contention.

MPE/XL release 2.2

- ALLBASE/Turbo Connect (ATC) provides ALLBASE/SQL read access to TurboIMAGE/XL data.
- ALLBASE/QUERY accessing TurboIMAGE/XL data through ATC.

MPE/XL Release 3.0

- Dynamic Rollback Recovery. A new set of intrinsics have been implemented to allow users to roll back a transaction programmatically.
- MUSTRECOVER enhancement to the Recovery Process.
- Multiple database transactions.
- A new database administration tool, DBChange Plus offers DBChange/V functionality plus more in native mode.

2H 91 and beyond

- Continue performance tuning.
- Generic key search. HP is currently working with Bradmark and DISC to deliver an architected interface which allows for the seamless integration of Omnidex and Superdex with TurboIMAGE/XL.
- IEEE data type.
- Critical item update.

As you might expect, our plans for Release 3.0 are firmer than post 3.0 plans, but take overall I think this represents an ongoing commitment to the product with plans which show a stream of enhancements several years into the future.

HP will continue to aggressively move the TurboIMAGE product forward supporting what we believe is a core part of the continuing HP 3000 success

Doug Dedo

Product Line Manager

HP Commercial Systems Division

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In the pantheon of office automation gods, electronic mail ranks right up there with word processors and spreadsheets. Now that everybody (or so it seems) has the latter, where's the mail?

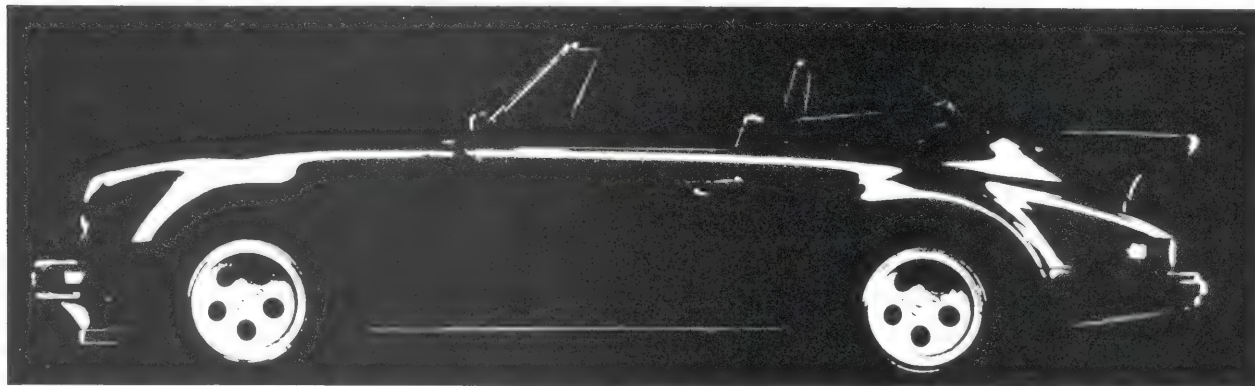
For the most part, E-mail hasn't caught on in the way we might have expected. The benefits of fast electronic messaging are obvious enough, but those benefits are hard to realize. Electronic mail is what you call a promising technology. Promising, but underachieving.

Granted, this analysis may seem a little harsh, seeing as a lot of people already use E-mail. But my barometer of E-mail implementation effectiveness is the FAX machine. When you're ready to throw away all your FAX machines, E-mail will be doing its job.

A big part of E-mail's problem is the difficulty involved in integrating products from different vendors. Each E-mail system is just an island in a bigger world, and we need to get those islands hooked up before we can start tossing out FAX

[BY GORDON MCLACHLAN]

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machines. Because of government procurement practices in the U.S. and abroad, the U.S. government standard, X.400, is getting a lot of attention. Many believe it offers the means to make real integration possible.

What Is X.400?

LIKE ALL OF THE standards, X.400 is difficult to translate into earth language. Not once do you find the words "E-mail" or "server" in the specifications. The X.400 folks don't even admit to having mailboxes, for crying out loud.

These pointy-headed types refer to an E-mail package as a Message Handling System (MHS). Mailboxes are known as the Message Store (MS), and everything else has weird names, too. But it really doesn't matter. If it collects and delivers messages like the post office does, it's E-mail to me. Oddly enough, Directory Service is a pretty self-explanatory name — something must have slipped past the jargon mongers. If you're a purist, you always can substitute the proper words as needed, but I wouldn't suggest this if you move your lips when you read. There's so much techno-speak in X.400, it could take all day.

CCITT X.400 and X.500 provide standards for the Applica-

tion layer of the ISO/OSI model. Because X.400 is an ISO standard, it is expected to be run on top of an OSI communications stack like X.25. Before you start groaning and turn the page, X.400 is pretty tolerant of which protocols are run underneath it. Implementations on TCP/IP and other networks are becoming widely available.

X.400 provides several services, and there's a whole passel of standards that make up the suite. But the thrust of X.400 is pretty straightforward: It offers standard ways to address the mail, relay it to its destination and provide message security, user authentication and delivery acknowledgement. It also defines the structure of the "domains" that make up a network, and what goes on between them, so that the network can be administered properly and they know where to send the bill.

Originators And Recipients

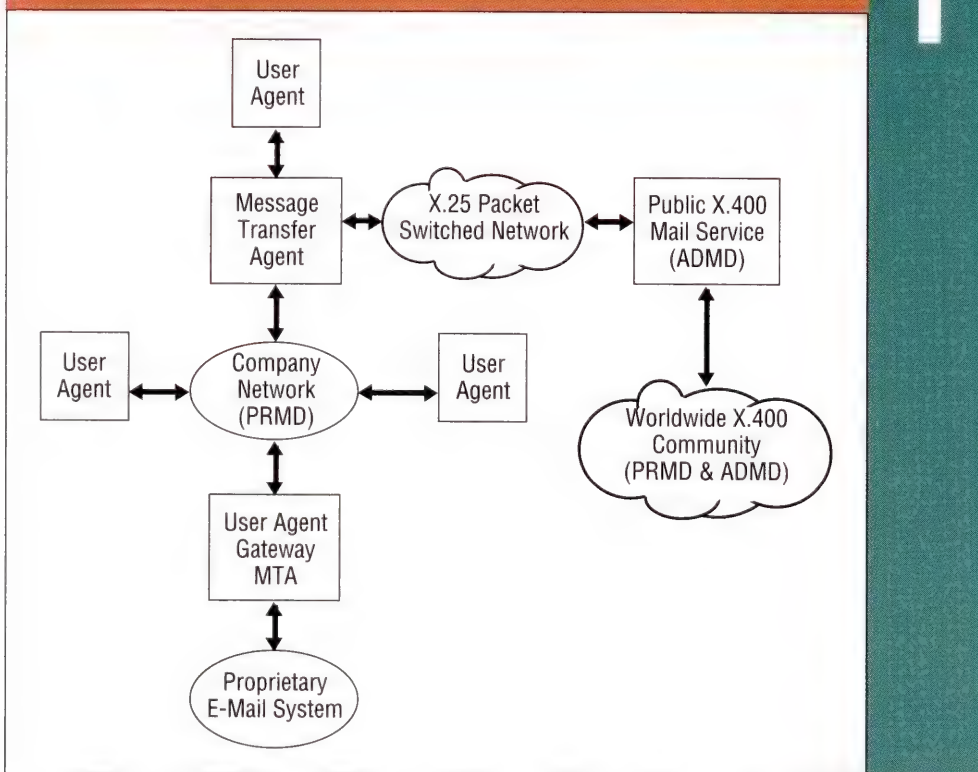
ORIGINATORS AND RECIPIENTS (O/Rs) are the users of the E-mail system. They may be human-beings, computer jockeys or computer programs that want to send and receive mail through X.400.

Each O/R has a unique address, called the O/R Name, which contains the user's name, organization, an organizational unit, the country he comes from and the domains the user belongs to. If that's not enough, there are some optional fields that can be used to tack on Internet addresses and other stuff.

Names can be pretty hard to deal with, so some kind of alias scheme is useful. X.500 provides a global address book for X.400 E-mail subscribers. When provided with a symbolic alias name, it produces a fully qualified mail address. The use of symbolic names isolates the user from the layout of the mail network, which makes life much easier. People move and networks change, so X.500 is one of those *real good ideas* that crop up every now and then.

Directory User Agents (DUAs) are pieces of software that ask X.500 DS for address resolution in a nice, civilized

FIGURE 1



X.400 Building Blocks.

The X.400 standards only specify the connections between different E-mail systems and how they are managed. They don't care how your mail system looks or feels, as long as it can talk the right talk.



and standard way. Both the User Agents and the Message Transfer Agents described below can use employ DUAs for address resolution.

User Agents

USER AGENTS (UAs) consist of software that creates submits and retrieves X.400 messages for the O/R. UAs provide the user interface and all of the chrome that we like to have wrapped around our E-mail systems. Accordingly, an X.400 User Agent has to effectively map the features of X.400 and X.500 into the proprietary stuff. UAs typically translate documents, perform filing and librarian functions and do many other things like provide bulletin boards and meeting scheduling.

Regardless of how fancy they are on the user side, all User Agents look the same when you flip 'em over. Their real job is to present the message handling system with a document it can use. The X.400 standards only specify the connections between different E-mail systems and how they are managed. They don't care how your mail system looks or feels, as long as it can talk the right talk.

Document Content

X.400 ACCOMMODATES DIFFERENT types of data or "contents" by breaking messages into "header" and "body" sections. The header provides information about the type of data that will be found in the body of the message. The body is the data itself. The contents are then placed in "envelopes" that contain addressing and delivery information for the mail system.

Part of the function of a mail system will be to properly compose and decompose documents, translating them as required by the local system.

X.400 deals with three main types of documents. Simple memos are text messages without any graphics or other strange

stuff. Compound documents may contain both text and graphics and have to be carefully described to allow the receiving system to pull them apart. EDI involves carefully formatted computer to computer transfers that never need to be seen by human eyeballs, but do, nonetheless, require careful handling. There also are "unidentified body part" messages, used to move unformatted binary files.

The office document architecture (ODA) is an ISO standard for the layout of compound documents. Even though it isn't part of the OSI model, ODA fits so naturally with X.400 that it has been adopted as a virtual standard. An ODA document can contain mixed text and graphics, that when sent, can actually be viewed and manipulated by the receiver. Is this hot stuff, or what? Or, will it just be another option on your word processor's Save command? We'll see.

Message Transfer Agents

MESSAGE TRANSFER AGENTS (MTAs) are the E-mail server systems that store and forward X.400 messages in the network. Every UA is associated with an MTA that does its X.400 dirty work for it. An MTA doesn't have to have any UAs under it. It could be a standalone relay system without any users.

In a store-and-forward system like X.400, the mail gets delivered even when there's nobody home. Users don't have to be online to receive mail. Mail messages are relayed between mail servers in the network until they get to the destination server where they are held for the user. When the mail is actually delivered, verification can be returned to the sender.

When an MTA is given a message by a UA, it creates a standard X.400 envelope and stuffs the mail message into it. The envelope contains recipient information, the document content type and the grade of the delivery service required.

After the envelope is prepared, the MTA forwards the mail message to another MTA in the network. The receiving MTA looks at the envelope's recipient address to determine whether the mail goes to a local user, gets relayed to another MTA, or is undeliverable.

Message Transfer Agents can be run on the same system as their User Agents, as they might in a mainframe installation, but this isn't required. The UA could be run on a workstation, with the MTA on a server.

Management Domains

MANAGEMENT DOMAINS ARE really a group of one or more MTAs that can be thought of as a mail subnetwork controlled by one organization. There are two types of management domain: Private Management Domains (PRMDs) and Administrative Domains (ADMDS).

Of course, the vendors aren't in the business of selling the standards.

To differentiate themselves in the market they have to put fins
and big chrome bumpers on their systems.



PRMDs are designed for use as private messaging systems. Different PRMDs can talk to each other if they are properly configured, but a PRMD can't message-switch between two other PRMDs. That's what Administrative Management Domains do.

ADMDs are switches between PRMDs and provide X.500 Directory Service to the network. ADMDs also provide billing and system management facilities that aren't available on PRMDs. For the most part, X.400 ADMDs are run by foreign Postal, Telephone and Telegraph (PTT) agencies and the public X.400 mail service providers.

MTAs in Administrative Domains have to communicate with other MTAs using X.25. Message Transfer Agents in a PRMD aren't restricted. This allows use of a LAN protocol like TCP/IP or the TOP connection-less service to connect MTAs. Although MTAs in different PRMDs could use a LAN protocol, in practice X.25 is more frequently used, because PRMDs are usually remote from each other.

The management domain may provide a private directory service for its own users. Domains also may provide a public directory that's available to User Agents of other management domains. This is optional, because you always can use somebody else's directory (for a small fee, of course) unless performance becomes a problem.

Implementing X.400 And X.500

X.400 AND X.500 ARE OBVIOUSLY standards to be reckoned with, and they ought to be part of your plans. The question is: Where in your plans?

The first complicating factor is competition between standards. The 1984 specs for X.400 didn't include X.500, provisions for moving FAX data or getting to the X.400 from the outside on a dial-up. The 1988 version took care of those things, but it's still bleeding-edge technology. It will be a year or two before the 1988 vintage is really ready. If you haven't already started, you might want to hold the line until your favorite vendor's software has proven itself in battle. Nothing will ruin your image like an E-mail system with holes in it.

Most organizations will use X.400 in one of two ways. If your mail network is a single-vendor affair, then maybe you just need

X.400 to get at the rest of the world. If you have a multivendor mail problem to deal with, you can use X.400 to handle that problem, too.

If you want to use a single-vendor approach in your own organization, and use X.400 to reach out and touch the rest of the world, that's fine. This allows you to stay with your familiar mail system without sacrificing X.400 connectivity. Getting at the outside can be handled in a couple of ways.

Gateways To The World

A COMMON APPROACH IS to use an X.400 server, which is both the UA and the MTA for your mail system. These are called User Agent gateways, because the proprietary mail system interfaces with the User Agent, and not with the MTA. In this case, a proprietary mail system would run on your network, and when X.400 services were needed, they would be provided by the server system.

The UA gateway has to translate addresses between X.400 and the proprietary system. It also must be able to map X.400 functions like delivery acknowledgement into the proprietary system. This approach therefore requires a lot of administration, because all of the users and their mail addresses have to be registered to allow the address translation.

The ideal approach is to use an E-mail system, with real honest-to-goodness X.400 User Agents, that can talk right to the MTAs. Good luck. This sounds great, but the problem is finding mail systems that are this well integrated with X.400.

Think Before You Multivendorize

HP AND MOST OTHER vendors have opted for the former solution, slapping layer upon layer of software on top of their proprietary mail systems, using X.400 gateways for everything. This method is standard, but it sure ain't cheap.

Of course, the vendors aren't in the business of selling the standards. To differentiate themselves in the market they have to put fins and big chrome bumpers on their systems. Gateways fit very nicely into the proprietary-but-still-standard marketing

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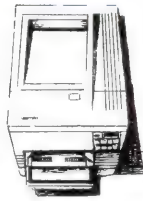
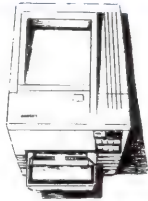
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NEW WAVE

theory that keeps profit margins up. No problem. Just so you understand it.

Face it. Mail is pretty mundane. It's nice, but everybody has mail. If everybody also has standard connectivity, then the chrome is even more important. Many of us have E-mail systems with a lot of stuff strapped onto them in the form of document librarians, word processing software, directories, scheduling and time management software, bulletin boards and the like. When the religious wars over E-mail systems crop up, it usually doesn't have anything to do with how the mail gets delivered. It's about the chrome.

The trick is to not use X.400 as an excuse to implement (or even to keep) a whole bunch of different mail systems. X.400 doesn't do chrome. It just delivers the mail. If all your proprietary features are going to disappear in translation to and from X.400, what good are they?

Besides, your goal is not to become a gateway expert. Getting a good mail system going might be more fun. Implementing X.400 might be a good opportunity to scrap some of the stuff you bought it to deal with.

Going Public With Your Problem

TO ACCESS YOUR REMOTE mail networks, you can either set up your own links, or you can use the ADMDs of the public X.400 services to connect your private domains. All it takes is money.

Because of the cost of server hardware and software, putting up your own X.400 network can get pricey. Unless you have a real multivendor mess to clean up, or a large volume of outside traffic, it may not be cost effective to go whole-hog on an X.400 system. If you have a low volume requirement, it might be better to stay with your proprietary system in-house, and use a public service for your external needs.

Public systems can be accessed on dial-up lines or, if you have one, through the public X.25 networks. The user interfaces are skimpy and the features they support are probably less sophisticated than the typical "office productivity tool" from your favorite vendor, but they do get the job done.

Public networks and foreign PTTs also offer X.25 access to their ADMDs if you want to connect your PRMDs to the worldwide X.400 network. Just remember that dialing in with a little itty-bitty modem isn't impressive. This is the dawn of the millennium. In today's high technology environment, dial-up is dull and unimaginative. Be bold. Get yourself a dedicated X.25 line to a public ADMD and bore right into that sucker. —Gordon McLachlan is a consultant with National Tech Team in Dearborn, MI.

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Understanding

NewWave

NewWave Computing Closes The Gap Between Technological Wizardry And Realistic Solutions

[BY DAVID W. BUTT]

There's one characteristic above all that marks the computer industry's history — a fascination with technological wizardry. Without a burning penchant for innovation, there would be no mini-computer or personal computer, no 32-bit micro-processor, and no laser printer.

This fascination with what's new, however, occasionally, has obscured a larger, more important question: What's needed? For all its inventiveness, the computer industry hasn't adequately addressed the realities of today's global economy. Indeed, technology, while overcoming old hurdles, often has created new ones.

These hurdles range from technologies that change too fast for customers to amortize, to systems and software that don't work together and are difficult to use, to a void in management tools that keep networks of computers up and running.

Happily, this is changing. For the industry as a whole, a new

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model of computing has emerged that is alternately called client-server computing or cooperative computing. This new model redefines how computers work together and how they are used by people.

Over the past several years, Hewlett-Packard has invested

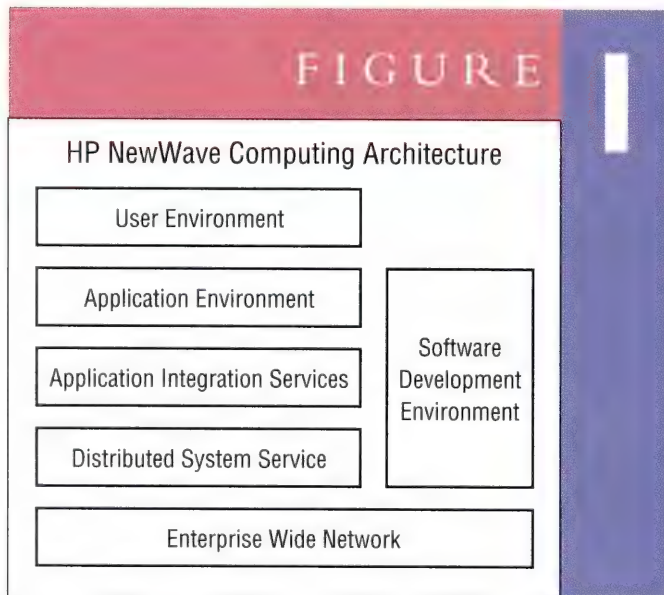
in a strategy called NewWave Computing, which attempts to overcome traditional technological hurdles and extend the idea of cooperative computing.

NewWave Computing Defined

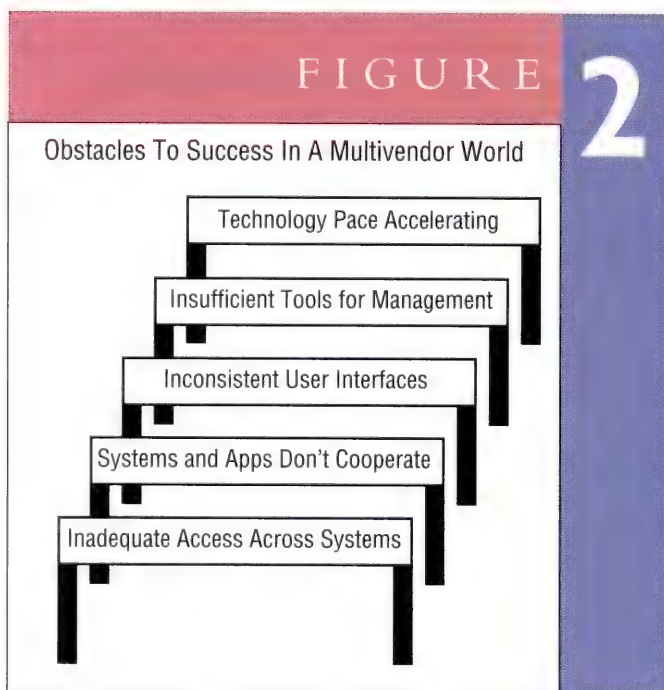
THROUGH ITS NEWWAVE COMPUTING strategy, HP is creating an environment in which any business person — whether an executive, a middle manager or an administrative assistant — can transparently obtain the needed services and resources from a network of computers that behave as a single integrated whole.

These services and resources might be physically processed or located on a minicomputer, a mainframe or other server, but they are delivered through a user interface that's easy to learn and use, and consistent across all applications. Simply put, users don't worry about the location of data, applications or other resources; instead, they concentrate on performing the business function.

For example, a sales manager with NewWave Computing capabilities can concentrate on the analysis of order entry data and other information to create a sales report, not on where the information is located, on how to use applications and data from different environments, or on how to mix different types of information in the same report. This type of easy access and ability to manipulate networked resources is a far cry from what's been available in the past.



The layers of HP's Computing Architecture deliver three capabilities: integration and management of system-wide services, integration of data and applications and a consistent user interface.



NewWave Computing addresses five hurdles that must be overcome to fulfill the vision of cooperative computing.

Eras Of Computing

THE POST-WAR ERA often is called the Age of Information. This age, however, hasn't been one event; rather, it's comprised of several stages.

The first stage was dominated by the mainframe computer in which large, expensive computer systems — generally clustered at corporate headquarters — were run by a team of highly trained computing professionals. Non-technical people had no direct interaction with the computers; instead applications were created to be run by technical people, who in turn would create reports for managers in functional areas.

Next came the minicomputer. Here, for the first time, computing resources were distributed to the functional levels of companies, yet the power rarely was made available to non-technical people. With the minicomputer, line managers could get information and reports on matters of specific interest more quickly than from centralized data processing departments.

Despite this greater speed, minicomputers still required sophisticated technical teams to operate the machines. Further, the decision tree of what systems to buy changed. For the first time, managers away from centralized data processing centers influenced and made purchasing decisions. Consequently,

computers and software were introduced that were incompatible with those at the central data processing center.

In the 1980s, individual computational power — in the form of the personal computer and workstation — made a dramatic impact on business. Suddenly, people in different positions had computing power available to them — personal power that often exceeded the power of mainframes sold in the 1960s. Further, new levels of incompatibility were introduced. Though standard operating systems emerged on the desktop (MS-DOS for PCs and UNIX for technical workstations), these devices didn't work with existing centralized and departmental systems.

Also, with individual power came individual choices in different brands and types of personal productivity software that compounded the incompatibility. Not only did each software package have its own rules and look, but often the files created with one package couldn't be easily used in another.

Despite the growing incompatibility, it's important to remember that each successive debut of computer technology did not obviate the need for previous technologies. Businesses didn't eliminate their mainframe investments with the dawn of the minicomputer, and they didn't rewrite all of their applications with the coming of the PC. Each computer played a unique role (albeit sometimes redefined) within the corporation.

This is the essence of cooperative computing — understanding that each computer plays different roles and is best-suited for different tasks.

New Solutions Beget New Hurdles

WHILE EACH STAGE OF computing cleared the hurdle of applying computer power at different levels, it coincidentally created new hurdles for the industry to overcome.

First, access across networked systems is inadequate. If PC users want to analyze corporate or departmental data, they have two choices: re-enter the data completely or understand arcane commands, database structures, locations and commands to use the mainframe and minicomputer data electronically.

Second, systems and applications don't interoperate. Even when physical connections are possible, protocols, applications and data are often so different that they can't be wed into the integrated solutions that satisfy users' needs. For example, the office worker must make compromises in the development and presentation of business documents. On the factory floor, design-for-manufacturing strategies are impeded by the reality that different operations are performed on different systems — systems that don't work together.

Third, user interfaces are inconsistent across systems and applications. Not only do mainframe, minicomputer, PC and workstation operating systems and user environments look and work differently, but also there's little or no consistency across applications — especially those from different developers or



Organizationally, companies must be flexible enough to work across functional and geographic boundaries. Technologically, this demands an information resources strategy that spans organizations, geographies and suppliers.

vendors. For example, a sales manager could be forced to learn 12 or more commands just to compile, prepare and distribute a monthly sales report. Not only would the manager need to know how to navigate through mainframe computing environments for access to centralized information, but also the different command structures of communications, word processing, spreadsheets, graphics and other PC software. Once those commands are mastered, the manager also must know how to merge all of the information into a single document — if that can be done at all.

Fourth, network management tools haven't kept pace with the growth of networked environments. The goal of the computer industry and its customers is to make all systems on a network behave as one. The problem, however, is that the complexity of the network increases exponentially as individual systems are added to it.

Companies can neither afford — nor are the skilled professionals available — to manage this increasing complexity. Instead, new tools are required that will allow central management of diverse, widely-dispersed computing resources.

Finally, the pace of technology is accelerating. No sooner do customers buy a computer, than a new one debuts that is faster, better and cheaper. Technology's pace is so quick that the business cannot fully amortize their investment.

These technical hurdles are compounded by new challenges in the global marketplace, regardless of industry: intense worldwide competition, compressed product life cycles, rapidly changing markets, squeezed margins, and geographically dispersed organizations.

Organizationally, companies must be flexible enough to work across functional and geographic boundaries. Technologically, this demands an information resources strategy that spans organizations, geographies and suppliers.

The industry vision of cooperative computing addresses each

of these issues. It underscores the importance of making information from multiple sources around the world available quickly and easily.

How NewWave Computing Differs

WHILE EACH VISION PURPORTS to overcome the technological hurdles, not all are the same. Indeed HP believes its vision outdistances other reported visions because of several differences.

First, NewWave Computing embraces and protects the billion-dollar investments that businesses have made in computing technology over the past two decades. Where competitors define new systems, networking and software architectures to achieve the goal of cooperative computing, HP's vision builds upon its customers investments; HP's NewWave Computing strategy is intended to be wholly evolutionary, although there are certainly revolutionary pieces of technology involved.

Second, HP's strategy assures the integration of new technologies as they are developed — and, their integration in a modular way that is less costly to implement. In effect, a company can make computing investments modularly as needed, while amortizing the cost of the entire system over time.

Third, NewWave Computing directly addresses the

multivendor, multiplatform investments that companies have made through the different stages of computing. Most computing operations today already involve more than one vendor. With NewWave Computing, the customer has the opportunity to make technology choices based on their specific needs and to work with best-in-class vendors.

The foundation of the NewWave Computing strategy is the concept of open systems. Open systems are software environments — from operating systems to networking and from databases to interfaces — that are designed and implemented in accordance with standards and commonly available on multiple platforms. This approach means more than UNIX environments. NewWave Computing makes a point of embracing the large installed bases of non-UNIX systems, such as HP 3000 business computers.

Fourth, the HP NewWave Computing strategy is based on concepts that orient toward business issues, not technological issues. This is a subtle, but important point. For many years, the computer industry focused on creating complete, turnkey solutions for customers. This works well for business environments in which processes are well-defined and linear, such as a manufacturing operation.

Static applications don't work, however, when the work is ad hoc, and data changes rapidly and frequently. What's needed are building blocks of tools that non-technical people use to

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create — in effect — their own applications. In NewWave Computing, technologies such as brokers and object management are enlisted to help users customize software for their business needs.

Finally, there is another difference between NewWave Computing and other vendors' solutions. The capabilities defined in NewWave Computing are available now, not in the future. Users can begin building their NewWave Computing environments today with modular, staged investments.

What NewWave Computing Delivers

NEWAVE COMPUTING BEGINS with the assumption that customers have invested — and will continue to invest — in networked technology as a means of improving their competitiveness. As noted earlier, the strategy builds on these investments with an architecture that works behind the scenes to provide three key capabilities.

The first is the integration and management of system-wide resources. Atop the enterprise-wide network of computing resources that companies have put in place, NewWave Computing adds a layer of distributed systems services. These services make possible the move from conventional networks of computing devices to intelligent networks. They should also allow any client to use any resource anywhere on the network, manage how user data, system data and multimedia elements are stored and accessed across the network and allow for configuration, administration and monitoring of all network systems from a single location.

The second capability is the integration of applications and data. A layer of application integration services provides the framework needed to allow different applications and data to be used together — without making wholesale changes to what already exists. Two components contribute to this capability. An object management facility creates logical links between different types of data and applications. A monitor and control facility provides a method for computerized agents to automate, manage and control the implementation of tasks they are asked to perform.

The third key ability is a consistent user interface that addresses the hodgepodge of environments, commands and interfaces that today's user faces. The HP NewWave desktop user environment is the software that users see on their screens and through which they interact with all networked resources. The environment defines — through intuitive icons that are symbols for different functions — how information is retrieved, filed, printed and mailed.

The HP NewWave user environment is tightly coupled with industry-standard windowing environments: Microsoft Windows for MS-DOS, Presentation Manager for OS/2, and Motif for UNIX. These windowing environments hide the complexities of the networked computing system from the user.



**NewWave Computing begins
with the assumption that customers
have invested, and will continue
to invest, in networked technology
as a means of improving
their competitiveness.**

NewWave Computing's capabilities don't benefit only the business user. They are equally beneficial to the computer professional whose challenge is to create and maintain the mission-critical applications that run businesses. The NewWave Computing strategy employs a variety of technologies, including object programming, that reduce the development time for these applications. Further, it includes the tools that computer professionals will need to write the small pieces of code that encapsulate existing applications into the overall environment.

Fulfilling An Industry Promise

THE COMPUTER INDUSTRY HAS been the source of some of the most remarkable and rapid innovation in history. Despite this genius for creativity, however, the industry on balance has not been able to fulfill and sustain the promise of greater productivity required in this increasingly complex, competitive world.

But times are changing rapidly. HP's NewWave Computing strategy fulfills that promise: through integration and management of system-wide resources; through integration of applications and data; and through a consistent user interface.

Already, HP has established pilot programs for NewWave Computing in businesses around the world — pilots that clearly demonstrate the strategy's effectiveness in improving individual productivity while preserving past investments in computing resources and remaining open to new technologies as they are introduced. And, unlike other vendors' efforts, these pilot projects demonstrate something else about HP's NewWave Computing: Businesses don't have to wait for the future. They can begin today. —*David W. Butt is marketing manager for HP NewWave Computing.*

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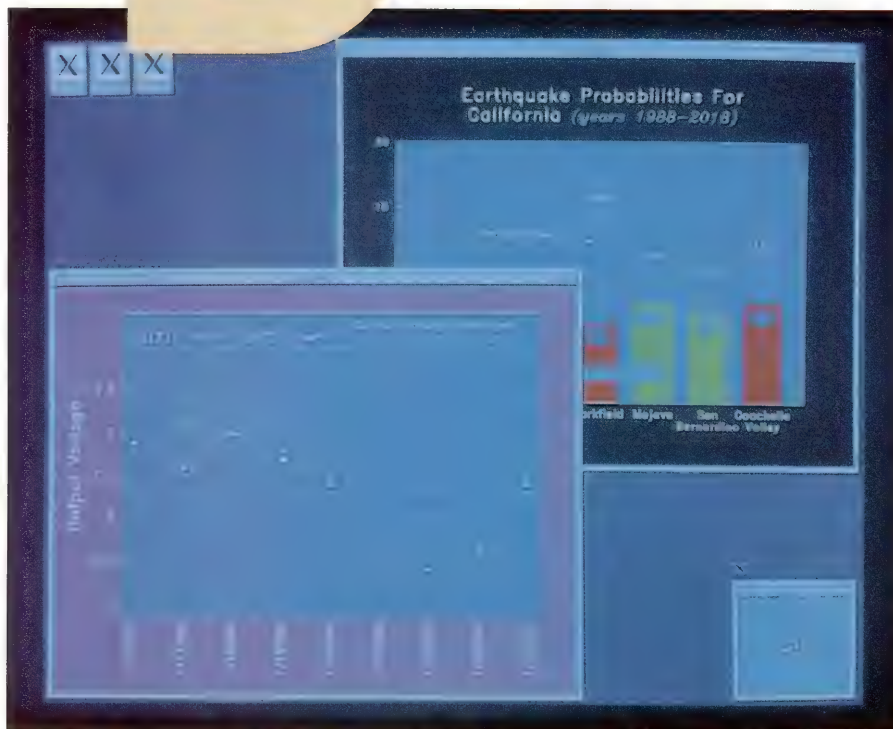
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Turning numbers into readable graphs, bar charts and pie charts is what

Graft does best. Graft, from Graphicus, (Kirkland, WA) is a developer-oriented graph generation software package for the HP 9000.

A nice feature of Graft is that it works with report writers to automatically generate reports that include graphics as well as text output. You can team up Graft and your favorite database report writers, such as those included with Oracle, Informix, Ingres and Progress. You can send the report writer output

By George T. Frueh





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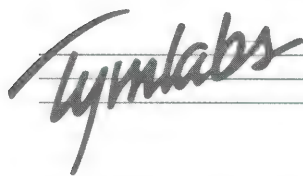
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G

*rafit comes with 18 demonstration
command files that include graphs, bar
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to Graft to generate graphics when you run your database report.

Graft also can be called from C or FORTRAN programs to allow program developers to display information in graphics form. Prototype graphics can be developed using the interactive command language. The resulting command files can be called from programs. This provides a good development environment for producing graphics programs.

We installed Graft Revision 4.70 on our HP 9000/834 running HP-UX 7.0. A single page quick reference installation guide is provided, followed by a detailed explanation of each installation step. Installation took about an hour and a half.

By default, the Graft program is placed in the `/usr/local/bin` directory so that all users have access to it without having to specify a special path. Graft uses `vi` as its editor and `ls` to do a directory listing. If a printer other than an HP 293x or a LaserJet at 75 dpi is used, you'll need to modify several of the Graft command files to reference the correct device configuration file names.

Run Graft, Make Pictures

After installing Graft on the 834, we executed it from an HP 700/X workstation with a color monitor. Two new windows popped up on the screen. The first window appeared as a black, "blank slate" reflecting Graft's "current state."

This window is initially blank because Graft's current state, when first executed, has not yet been defined or altered. Alter

Graft's current state by entering and executing Graft commands. Unlike standard UNIX commands, Graft commands aren't case sensitive.

A list of the Graft command set can be obtained by entering `HELP` or `?`. To acquire information, such as the correct syntax for a specific command, you enter `HELP` followed by the command. For example, entering `HELP PIE` would give you information on the `PIE` command.

Graft has the ability to remember the last 20 commands you typed in. When you type in `/` followed by the return key, Graft displays the last 20 commands you entered. Using the up/down arrow keys, you can move the cursor to any one of these commands and then press the return key to execute that command.

Graft comes with 18 demonstration

command files that include graphs, bar charts, pie charts, timing diagrams and scientific characteristic curves. You can view these demos individually or back-to-back. To view the demos back-to-back, we entered the command line "DO demos". Each graph is displayed in turn by pressing the return key.

Generate Simple Curve Charts

A tutorial section in the Graft User's Manual introduces you to the Graft command set and enables you to produce simple curve, bar and pie charts.

The Graft tutorial creates graphs based on the definition of the current state of the system. The `GO` command causes the current state of the system to be displayed on the current device (usually your CRT). After the `GO` command is entered, a dotted border appears around the outer edge of the blank-slate window. The dotted border represents the shape of an 8.5 by 11-inch sheet of paper. When a command is specified that changes the current state, you can enter a `GO` command to display the change.

To generate a curve chart with two curves, we had to supply Graft with data. Graft can accept data in one of two ways. The `DATA` command lets you input data manually from the keyboard. `READ` command allows you to read it from a file.

We read in the sample file **tutor.dat** provided with the Graft software. This data consisted of three columns of numbers representing the physical growth rates of male and female infants over a three year period. The first column labeled `MONTHS` in six-month increments (0, 6, 12, 18, etc.) The second and third columns, were labeled `LENGTH OF FEMALES` and `LENGTH OF MALES`, measured in inches.

Once we read in the data from **tutor.dat** using the `READ` command, we used the `CURVE` command to specify how Graft interprets the data within the three columns. For example, the first column (`MONTHS`) represents the X data values and the second and third columns represent the two sets of Y data values for the two curves.

GRAFIT

PLATFORMS: Sun-4, HP 9000/300/800

PRICE: Ranges from \$1,500 to \$8,200 based on operating platform.

HEADQUARTERS:

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(206) 828-4236 FAX

FOUNDED: 1982

PRODUCT LINE: Graphic and analysis software solutions for business users on UNIX and DOS platforms.

OWNERSHIP: Private

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The syntax for the CURVE command is the word CURVE followed by an index number (to identify it), then its X and Y values. The command

```
CURVE 1 X C1, Y C3
```

says that for curve 1, the X values are in Column 1 and the Y values are in Column 3.

To generate a basic two curve chart using the data in **tutor.dat**, we entered the following commands:

```
READ tutor.dat
CURVE 1 X C1, Y C3
CURVE 2 X C1, Y C2
GO
```

The result of these commands produced a rectangular chart with numbers along an X and Y axis representing infants age in months and their length in inches. Also, two curves appeared in the center of the graph. Curve 1 represented the male infants and was created using a solid line, while Curve 2 represented the female infants and was created using a dotted line.

Using additional Graft commands we were able to place labels along the X and Y axes and also place a title across the top of the graph. The Graft commands used to do this were XNAME, YNAME and TITLE.

Graft Commands

Curve charts have many command options. You can smooth the lines using the SMOOTH command, fill areas of the chart using the FILL command, label the data points with their values, or turn lines

off and symbols on to make a scattergram.

You can perform various types of regressions on curves such as linear, polynomial, exponential, logarithmic and power regressions. You also can create step charts and histograms.

Graft's User Manual is comprehensive and covers all the commands thoroughly. Sample programs are also provided for you to work with and learn from. With Graft, you'll be turning numbers into understandable, meaningful graphs and pictures in no time. ■

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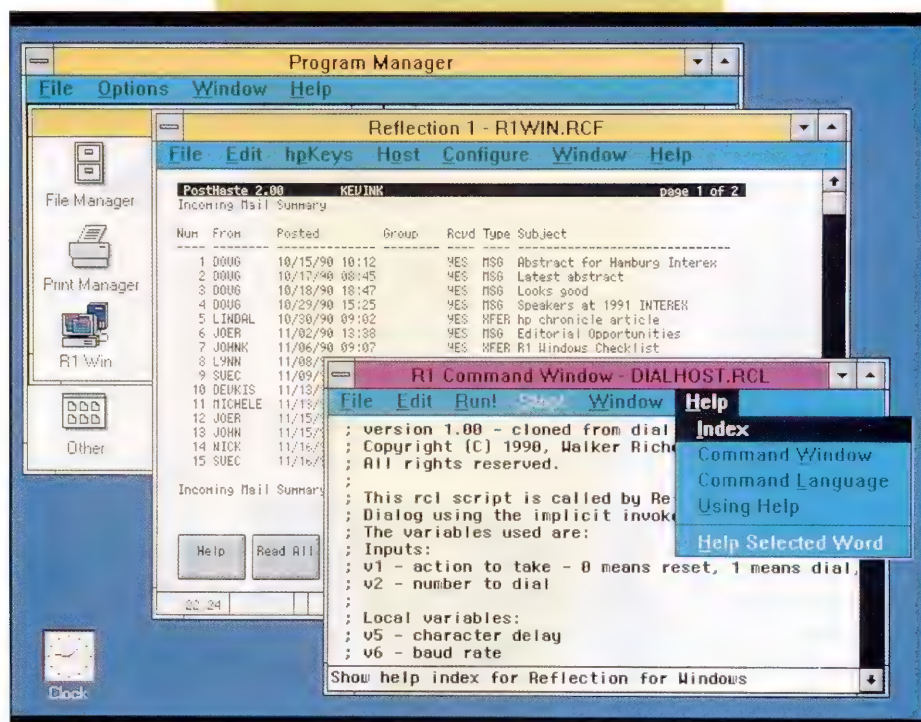
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[AFTERTHOUGHTS]

- Graft is a program development tool that generates technical charts and graphs to your specifications.
- Graft can produce graphics reports from database report writers.
- Graft is callable from C or FORTRAN programs.



Windows Of Opportunity

WRQ Heralds Reflection I For Windows

The name Walker Richer & Quinn (Seattle, WA) always has been synonymous with high-quality terminal emulation software. Its first entry into the Microsoft Windows environment is no exception. Reflection 1 for Windows is a program that runs under Microsoft Windows 3 and emulates the HP 2392A intelligent terminal.

Because it's based on Windows, the hardware and software prerequisites for the package are easy to describe: If your

system runs Windows 3, you can use Reflection 1 for Windows. I tried the product on both a Classic Vectra with an EGA display and on a 386 PC with a VGA display. As you'd expect, Windows works faster on the 386 and the VGA display is crisper, but overall it worked very well on both systems.

In addition to HP 2392 emulation, Reflection provides an array of file transfer capabilities, as well as the ability to do background processing. It also



By Miles B. Kehoe

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Probably the nicest feature I found in
*Reflection 1 for Windows was its ability to resize
 the session window to virtually any size.*

features the same BASIC-like Command Language as the other Reflection products. This gives you the ability to create and execute batch programs that perform simple tasks like logging into your HP 3000 or more complex tasks like dialing a remote service and downloading a program file.

Windows Integration

Reflection 1 for Windows is fully integrated with Windows 3. Although it can process in the foreground as the active task, it works fine when other processes are in control. For example, you can start downloading a file, open another Windows application and work with it until the file transfer has completed. If you have multiple communications ports, or use a network connection, you can even open additional host windows and work on a host program while transferring files.

Like other Windows applications, Reflection 1 for Windows takes full advantage of the Windows clipboard and cut-and-paste functions. You can copy text between Reflection 1 for Windows and other applications, even between two Reflection 1 for Windows sessions. And, WRQ has integrated its Help facility into the standard Windows Help, so Windows users should know how to access it.

Probably the nicest feature I found in Reflection 1 for Windows was its ability to resize the session window to virtually any size. Of course, most applications let you resize the window but they also clip any text that happens to run off. Reflection 1 for Windows scales the contents of the entire window and reduces it proportionally, so you always see a full 80-column by 24-line screen.

This means I can fit two full terminal session windows on my normal VGA display. I don't know of any other terminal emulation software that will let me do this, although I need to keep my bifocals handy to read the softkey labels.

File Transfer

In earlier Reflection products, WRQ has gone to great lengths to provide the ability to exchange text and binary files with a variety of host minicomputers. Usually this is accomplished by the PC application establishing a connection to a program running on the host system and the two programs working together to copy the files.

When you purchase Reflection 1 for Windows, you also receive the host

programs for the HP 3000, VAX/VMS and UNIX host systems. In addition, WRQ provides Reflection command files that upload the program to the host—a tricky way to bootstrap the file transfer capability onto itself. It may sound complicated, but the documentation clearly defines each step along the way. I even put the process through my kind of stress test. I asked my manager to do the upload, and even he could do it.

Network Support

Reflection 1 for Windows supports an impressive array of network protocols including LAN Manager and OfficeShare from HP, StarLAN from AT&T, IBM LAN Asynchronous Connection Server, as well as WRQ's Telnet Connection and 3000 Connection software. You can use Reflection 1 for Windows over a serial connection from 300 baud to 57,600 baud, and using hardware or software handshaking.

Help!

I manage an online support group, so I know how difficult it can be to answer the phone quickly and get the correct engineer on the phone right away.

During my evaluation, I found my

[JUST LIKE THE OLD TIMES]

It's been several years since I used a real Hewlett-Packard terminal, and I was surprised how much I've missed the familiar softkey labels and built-in capabilities that Reflection 1 for Windows provides. In fact, not since the HP 150 have I found a better way to use remote computer services like CompuServe or other bulletin boards. The ability to lock text at the top of the display, to log text from the remote system to a file or to a printer at the press of a softkey, or to move the cursor around the screen without sending control sequences to the host computer—these are all things I used to rely on all the time, but haven't been able to do on my PC.

WRQ has managed to include some of the look and feel of the HP 2392, but has made improvements in the interface where it didn't change functionality. For example, Reflection uses a full-screen menu to locally define the contents of the User Softkeys. It's a great improvement over the cryptic HP screen and even provides help.

WRQ has extended the standard HP 2392 escape sequences. Reflection includes the ability to execute a local command language procedure in response to an escape sequence. If you are a data center manager with responsibility for a number of PCs, you can use this capability to initiate unattended system backup from the minicomputer, or to perform any other operation that a user can perform locally. This gives you greater control over your distributed PCs, helps you do your job better, and can make your users feel better about their PCs.

—Miles B. Kehoe

self stumped twice, and tested WRQ's online support. Both times a person answered the published support number within three rings and asked the nature of my call. After hearing a brief description of my problem, this person directed my call to a support engineer. Both times the support engineer answered the forwarded call on the first ring. And both times, I had a solution in less than five minutes.

My first problem was with connecting to my TCP/IP network via Telnet. After a few brief questions, we determined that I needed the WRQ's Telnet Connection application, which is sold separately. If I had checked in the Quick Start Guide instead of focusing on the Technical Reference Manual, I could have answered the question myself.

The second call was in response to errors I was receiving when uploading the VAX/VMS file transfer program over modem. Three times I received errors that suggested I call Technical Support. The only thing unusual was that I was running NewWave as well as Windows, so the developer on the support line suggested running with Windows alone. When I did, I got the same error.

Before calling a third time, I reviewed the steps in the manual one final time. (Online support people like me hate it when the support line they call discovers the problem was user error). I discovered I had omitted the step that clearly says "use no parity." Following the steps in the manual, the upload worked fine.

WRQ also supplies an impressive documentation package that includes a Quick Start Guide, a Technical Manual and a Command Language Manual. All are well written and present both theory and step-by-step instructions.

Perfection Is Not Too Far Off

Reflection 1 for Windows is worth the suggested \$399 price tag. It's one of the finest products in its category I've ever used. However, no matter how good something is, I can usually come up with a suggestion or two.

In my company, we use HP systems as

well as systems from Sun, Digital and others. Some of these do provide limited support for HP terminals, but the majority provide better support for ANSI standard terminal emulation. I'd like to see Reflection 1 for Windows with both HP and ANSI modes so I could switch back and forth quickly, and perhaps even use different emulation in different sessions.

The other thing I'd like to see is the ability for Reflection 1 for Windows to learn a command script by monitoring my keystrokes. Several terminal applications include this ability, and it really makes writing command scripts much easier.

I wouldn't be surprised to see one or both of these capabilities sometime in the future. Then I'll have my perfect terminal program.

Occasionally, I review a product that can be useful everyday. I forgot how much I've missed using the old, reliable HP terminal interface with mode keys, user keys and features like memory lock. With Reflection 1 for Windows, I'm able to get all those features and still work in my everyday environment — Windows (and NewWave).

For an outstanding HP 2392 terminal emulator, and if you use Windows on your Vectra, this is the product for you. It comes with functionality, features and support — a combination hard to beat.

Reflection 1 For Windows

PRICE: \$399. Through April 1, 1991, current users can upgrade for \$125; AdvanceLink and Session users can upgrade for \$150.

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PC TIPS

Miles B. Kehoe

OS/2 Configuration Files

If you already have OS/2, you can probably use some of these technical details right away. If you don't use OS/2 yet, you might use this discussion as an excuse to begin investigating its possibilities.

In MS-DOS, there are two files used at start-up: CONFIG.SYS and AUTOEXEC.BAT. Because of the way MS-DOS evolved, entries in both of these files can affect the operation of your system. AUTOEXEC.BAT is actually a function of the command interpreter COMMAND.COM.

In OS/2, CONFIG.SYS is the only file that establishes system parameters. This file specifies the device drivers, system parameters, and even program and data paths used by all programs in the system.

There are two modes of operation in OS/2, and each has a different command interpreter. Protected mode uses a program called CMD.EXE, while real mode uses a special version of COMMAND.COM.

Each has a start-up batch file that executes when the command interpreter first executes. The protected mode CMD.EXE executes a file called STARTUP.CMD, while the real mode COMMAND.COM will execute AUTOEXEC.BAT.

When you start your system in OS/2, the system loads using the configuration information stored in CONFIG.SYS. Next, Presentation Manager (PM) loads and displays the graphical user interface, not unlike Windows 3 under MS-DOS.

If you have a file named STARTUP.CMD, OS/2 opens the protected mode command interpreter in a window

and executes the commands in the file. This only executes when you first boot your system, and is normally used to start specific applications, not to change the system configurations.

One process you can start from PM is the real mode command shell, which allows you to run MS-DOS applications. The first time you do, OS/2 will execute the commands in AUTOEXEC.BAT. This real mode AUTOEXEC.BAT is

usually not the same file you execute when you boot MS-DOS on a dual-boot system. The PATH in real mode, for example, should include the OS/2 real mode command directory.

This directory includes real mode versions of standard MS-DOS applications like CHKDSK and FORMAT. When you're actually booting in MS-DOS, the PATH should include the actual MS-DOS command directory, which contains MS-

FIGURE

CONFIG.SYS

```
PROTSHELL=C:\OS2\MSHELL.EXE C:\OS2\OS2.INI C:\OS2\OS2SYS.INI C:\OS2\CMD.EXE
SET COMSPEC=C:\OS2\CMD.EXE
LIBPATH=C:\OS2\DLL;C:\e\TOPIC22\_OS2\BIN;
SET PATH=C:\OS2;C:\OS2\SYSTEM;C:\OS2\INSTALL;C:\e\TOPIC22\_OS2\BIN;
SET DPATH=C:\OS2;C:\OS2\SYSTEM;C:\OS2\INSTALL;C\;
SET PROMPT=$i[$p]
SET HELP=C:\OS2\HELP
SET BOOKSHELF=C:\OS2\BOOK
BUFFERS=30
DISKCACHE=64
MAXWAIT=3
MEMMAN=SWAP,MOVE
PROTECTONLY=NO
SWAPPATH=C:\OS2\SYSTEM 512
THREADS=128
SHELL=C:\OS2\COMMAND.COM /P
BREAK=OFF
FCBS=16,8
RMSIZE=640
DEVICE=C:\OS2\DOS.SYS
COUNTRY=001,C:\OS2\SYSTEM\COUNTRY.SYS
DEVINFO=SCR,VGA,C:\OS2\VIOTBL.DCP
SET VIDEO_DEVICES=VIO_IBMVGA
SET VIO_IBMVGA=DEVICE(BVHVGA)
DEVICE=C:\OS2\INTDD.SYS
DEVICE=C:\OS2\MSSER01.SYS MODEL=199
DEVICE=C:\OS2\MOUSE.SYS TYPE=MSSER$
DEVICE=C:\OS2\MDD.SYS
DEVICE=C:\OS2\EGA.SYS
SET KEYS=ON
DEVICE=C:\OS2\COM01.SYS
```

A typical CONFIG.SYS.

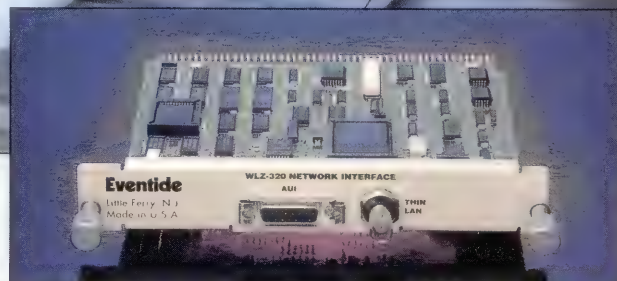


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"outmoded" Series 200 and 300 computers into networked workstations—with Ethernet network performance, typically five to ten times faster than Shared Resource Manager. In addition, Ether Board comes with Eventide's proprietary BOOTROM that allows *all* Series 200 computers (along with older 310 and 320 models) to boot using a central server.

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DOS versions of CHKDSK, FORMAT, and other standard utilities.

Change The Configuration File

When you install OS/2, you provide information about the type of monitor,

mouse, and file system you want. The installation program uses this information to build the CONFIG.SYS file.

As with MS-DOS, you can make changes to the CONFIG.SYS. Sometimes these changes can make it impos-

sible to boot. Whenever you make a change, be sure to save the previous CONFIG.SYS, and have a floppy disk with a bootable system image.

One of the options you have when you install OS/2 is to use the high-performance file system (HPFS) unique to OS/2, or to use the MS-DOS compatible File Allocation Table (FAT) file system. I strongly suggest you configure Drive C: as a FAT drive even if you won't be using the dual-boot capability of OS/2.

I say this because it is far easier to boot MS-DOS from a floppy drive than it is to boot OS/2. If you make changes in your OS/2 CONFIG.SYS and find your system can't boot, you can simply boot from an MS-DOS floppy disk, correct the problem in CONFIG.SYS, and reboot OS/2.

One of the first things you'll notice about the OS/2 CONFIG.SYS (see *Figure 1*) is how similar the entries are to MS-DOS commands. For example, you see the DEVICE command near the end of the file, specifying device drivers and parameters for a mouse device (POINTDD.SYS, MSSER01.SYS and MOUSE.SYS) and for the EGA mouse device (EGA.SYS). Don't confuse this mouse-related EGA utility with the VGA screen devices specified earlier in the file.

You'll also notice that you set the PATH and PROMPT in CONFIG.SYS under OS/2, not in the STARTUP.CMD file. In fact, the SET command can be used in either file, but it is most often used only in CONFIG.SYS.

Dynamic Link Libraries

One thing you'll note in *Figure 1* is the LIBPATH entry. It looks and behaves like the PATH statement, but it provides a very special capability required by many OS/2 applications.

OS/2, unlike MS-DOS, allows multiple instances of the same application to execute at the same time. To conserve memory and to provide for more efficient program execution, program developers can locate the library routines for their application in a special file called a DLL file. Every instance of a program

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can load routines into memory from the DLL file only as the routines are needed, and thereby use less memory.

However, when a program needs routines from the DLL, OS/2 must be able to locate the DLL file. The LIBPATH command in CONFIG.SYS provides a path through which OS/2 will search to locate a DLL requested by any application. If you ever have an application that gives an error locating a DLL file, it is this LIBPATH you must change to include the path to the required DLL. Many OS/2 users simply locate all their DLL files in the system DLL directory \OS2\DLL.

Data Path

Another unique feature of OS/2 is the ability to specify a path to be searched for data files. This isn't unlike the APPEND command in MS-DOS and real mode OS/2. Because several OS/2 utilities expect to find data files via DPATH, it's acceptable to append to the default DPATH, but not a good idea to remove the default entries!

Real Mode Entries

There are a few entries that are used only in real mode. First, and most importantly is the PROTECTONLY entry. If this is set to YES, OS/2 won't allow any real mode applications to run. Hence, you cannot use any MS-DOS applications on your system.

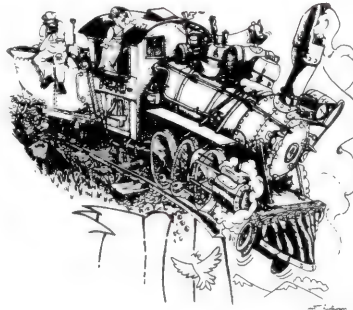
If you specify PROTECTONLY=NO, then you can execute standard MS-DOS applications in real mode under OS/2. The maximum amount of memory that your real mode application will have is specified by the RMSIZE parameter. Unfortunately, even if you specify the maximum RMSIZE of 640 as I have in *Figure 1*, you will have only about 550 KB of memory for MS-DOS applications. This is probably the biggest obstacle to widespread acceptance of OS/2 today. —Miles B. Kehoe is an online support manager for Verity Inc., Mountain View, CA.

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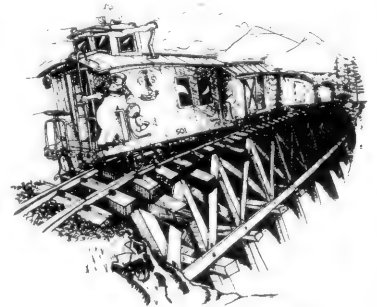
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Our Profile

Now that I've been writing this networking column for a

year, I can call myself an "industry observer." I want to get a promotion to "noted industry observer," but I think that means I have to get quoted in *Business Week* or *The Wall Street Journal*.

I feel driven to put the last year into some sort of perspective, and offer you some startling new insights. After all, if I want to be a noted industry observer, I have to come up with some notable industry observations. Here goes.

Networks are still the only bright spot in an otherwise dismal marketplace. Sales for minis and mainframes have been flatter than Nebraska, and the PC marketplace is only a little bit better off. We're seemingly on the verge of a real consolidation of the marketplace. I wonder what we'll see when the dust settles.

It seems like the computer industry needs double-digit growth to cope. Anything less and they can't make a profit. The costs of R&D and marketing are very high in this industry, and the combination of upward pressure on expenses and downward pressure on profit margins is a deadly combination.

Vendors are struggling to tap new markets or increase share in the markets they have, and obviously, everybody can't succeed. As a result, some formerly venerable manufacturers are circling the drain. Unisys, Wang and Data General are just waiting for the fat lady. And, though not exactly failures, HP, IBM and DEC have all been cutting their workforces. Things aren't happy.

Part of the problem is a lack of product innovation. Where are the hot new technologies? Everything's getting smaller and cheaper, but what about real innovation? I see lots of new products, but

everything seems to be a retread. I swear that I haven't seen a really great new idea since HP brought out the laser printer.

CASE, multimedia, image processing and AI all have been heralded as big new things, but they've all been greeted with customers' blank stares and bored yawns. On the other hand, we're still in a feed-

Networks are still the only bright spot in an otherwise dismal marketplace.

ing frenzy over network standards. Standards seem to have replaced innovation as the industry's holy grail.

Part of me wants to believe that this is a wonderful thing, but I'm not convinced. There are some downsides to standards. It may not be politically correct to say so, but are standards what we want? Our chasing standards is a bit like a dog chasing cars: What do we do if we actually catch one, drive it?

Open Wide

The promise of networks is in downsizing and reduced costs. At least that's the theory. Standards and "open systems" are seen as the way to realize that dream.

The corollary to reduced costs for us is reduced profits for vendors. That means skinnier margins and less cash for R&D. That's fine for clone-makers, but it doesn't bode well for the industry as a whole. That's why there is almost no U.S. memory chip industry. Soon there may not be an American hardware industry at all. I guess everybody in Silicon Valley is going to start writing TCP/IP ports and hack on Taiwanese UNIX boxes? Regardless, the vendors are re-

sponding like lemmings. They have to. If we want standards, we'll get standards. Hundreds of them if need be.

Everywhere you look, there are signs of the times: the Open Systems Foundation, the X/Open Consortium, the ISO Open Systems Interconnection (OSI) model the Corporation for Open Systems and the Government OSI Profile (GOSIP). I'm starting to say "open" more frequently than my dentist.

Unfortunately, it's still not exactly clear what an open system is. Some think that a standard network is open enough. Others insist an open system means a standard network with UNIX boxes on it. Others seek interoperability, portability and scalability, which sounds like it would make a good Latin motto. Whatever it is, we'll be able to buy some. That's what vendors are for.

It's not even clear what a standard network is. As a matter of fact, you get your choice. Pick a de facto standard, an industry standard, a de jure standard, or just be obstinate and buy IBM. Somebody will find a way to hook it up to almost anything else and then they'll figure out a way to sell it to you.

The Distant Future Of OSI

The ongoing phenomenon is TCP/IP. It was supposed to be the interim strategy (is that an oxymoron?) while we waited for OSI to show up. On the OSI front, however, all we've seen is another year's delay. As a result, one wag has prognosticated that OSI is anywhere from three to 50 years in the future. I'll buy that. Maybe the problem is that we want to standardize on the stuff we've already got, rather than on something that we might have someday. Maybe if ISO hadn't forgotten about LANs and network management it might have turned into something sooner.

All those PCs and workstations didn't wait for ISO networks to show up. For that matter, they didn't even wait for OS/2 to show up. We're impatient vultures, and we weren't willing to wait for these cows to drop dead at our feet. Instead, we set out to kill something. Now, with bellies full of TCP/IP, those cows don't look so appealing. We've got networks that are actually starting to network. Why foul it up?

Besides, we can rip off whatever hot licks ISO comes up with for OSI and slap them on top of TCP/IP. As a result, everybody is too busy grafting the nice stuff like X.400 and X.500 to TCP/IP to implement the whole ISO stack.

Even the GOSIP specs the government puts out, that point the way to OSI implementation, make it quite acceptable to put together these Frankensteinian OSI/TCP hybrids.

So after a year, I'm left with an impression of a moribund industry full of me-too standards followers, no apparent leaders and a pocketful of promises. As a result I am more confused than ever. That's a bad situation for a man with lots of opinions and an attitude problem.

Maybe we can find some measure of consolation in our faith. Just say this little prayer to the government each day while pondering how long it's going to be before the ISO standards catch on:

Our profile

Which is in Washington

GOSIP is thy name

Thy time has come

Thy will be done

In the real world as it is in UNIX

Give us this day our TCP/IP

And forgive us our incompatibilities

As we forgive those who are

incompatible with us

Lead us not into closed systems

But deliver us from vendors

For you have the standards, the

power and the money to make it stick

Amen.

Sweet Sorrow

Well, this is it. Next month I'll be turning this column over to my able successor, Tim Cahoon. My networking col-

umn is moving to our sister publication *LAN Computing*. Actually, you may prefer seeing my work there. *LAN Computing* is a tabloid, which makes it easier to fold up and tuck inconspicuously under your arm when you head for the john.—

Gordon McLachlan is a consultant with National Tech Team in Dearborn, MI.

Editor's Note: If you're heartbroken by Gordon McLachlan's farewell, fear not. Gordon will continue to contribute regular feature articles to *HP Professional* in the coming year.

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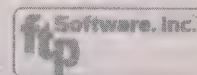
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MANAGING YOUR HP 3000

John P. Burke

"...the times they
are a-changin'"
— Bob Dylan

Those famous words were written more than 25 years ago, but they accurately characterize the computer industry today. In fact, in our little corner of the world, the fundamental relationship between HP and its installed base of HP 3000 users has been undergoing significant change.

Users of the RAPID products are the latest, but probably not the last, to be buffeted by these winds of change. For HP: The decision to effectively kill off TRANSACT, ALLBASE/4GL, etc. was wise, perhaps even necessary, but miserably handled despite noble intentions. For the outraged SIGRAPID members: Reconsider your basic software strategies and be thankful that HP is your hardware vendor.

I use "RAPID" and "TRANSACT" interchangeably to refer to the former RAPID products, TRANSACT/3000, REPORT/3000, DICTIONARY/3000, INFORM, etc., and their follow-ons such as BRW. Also, I include ALLBASE/4GL, HP's stillborn 4GL, for its relational database ALLBASE/SQL, under the RAPID heading.

TRANSACT Business

The firestorm hit last August during the SIGRAPID meeting at the INTEREX conference in Boston. SIGRAPID members came to the conference feeling good about the future of their beloved TRANSACT. They expected to hear about the status of their enhancement requests and about a much rumored super follow-on product to TRANSACT that would make use of two in-vogue concepts: a data repository and client-server computing. Instead, they got

kicked in the teeth: The follow-on product had been scrapped and HP would not be enhancing TRANSACT.

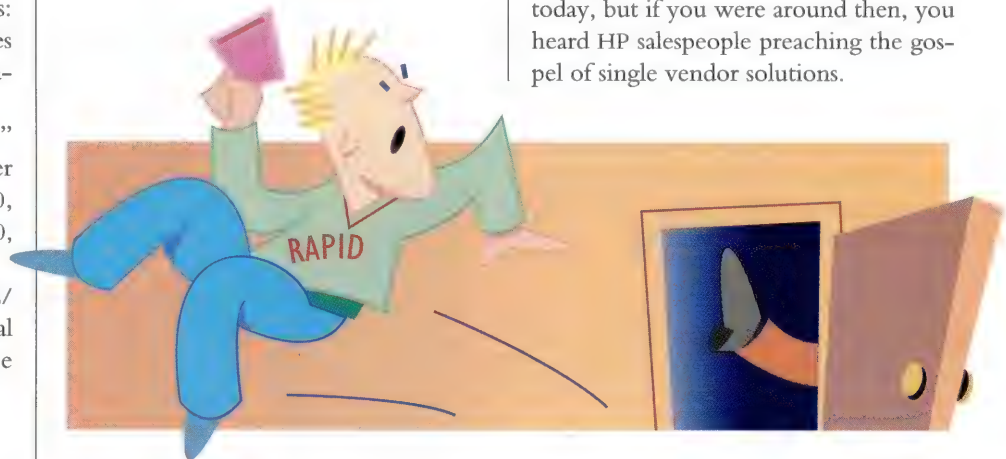
Perhaps even more surprising than the announcement, given HP's public statements to date, was the way it was (mis)handled. Chief damage control officer Rich Sevcik, otherwise known as general manager of the Commercial Systems Division, rushed to the scene the next day fresh from the TurboIMAGE disaster. He presented what is sadly becoming the new "HP way" for dealing with problems. To paraphrase: HP has a commitment to its customers. Give us a prioritized list of what you want, and we'll get back to you in writing.

To be fair to Sevcik, it was probably

must come to terms with a basic fact: HP is *not* a software company. It's in the business of selling hardware. For some reason, HP is either unable or unwilling to come clean with the installed HP 3000 user base about this. And, to be smart, current customers should focus on their self-interests and formulate their strategic plans independently of HP.

A Historical Perspective

In the early '80s, 4GLs were a hot item, and Hewlett-Packard wanted its own 4GL for the HP 3000. The company was operating under the strategy that potential new customers were looking for a single vendor that could fill all their computing needs. It almost sounds funny today, but if you were around then, you heard HP salespeople preaching the gospel of single vendor solutions.



the best he could do under the circumstances. But the announcement certainly came as a sudden surprise to many users. As late as July and August of last summer, articles appeared in various trade papers about the glorious future of TRANSACT. Why? Because HP made some very public promises about the future of TRANSACT, to SIGRAPID in particular and to TRANSACT users in general. Was HP deliberately misleading customers, or was this a case of corporate schizophrenia?

Both HP and its current customers

HP didn't want just any 4GL. It wanted a 4GL that would use V-PLUS, and hence, leverage the sale of HP's terminals. Remember, this was before the PC with HP terminal emulator became common and there were few alternatives to a genuine HP block mode terminal if you wanted to use V-PLUS.

POWERHOUSE and SPEEDWARE, then as now were the dominant 4GL players in the HP 3000 market. Neither

required block mode terminals for their products. The RAPID products from IMACS, on the other hand, used V-PLUS and required block mode terminals. HP had money but felt it had no time to develop a 4GL in-house, so it negotiated the RAPID acquisition.

After the purchase, HP positioned the RAPID products as "prototyping tools." The idea was to use RAPID to design and create rapidly (get it?), in an iterative process with your customer, a prototype of the application. Then, over time, you would convert the system to a 3GL (probably COBOL) utilizing the databases and V-PLUS forms designed in the prototyping step. To its credit, HP never encouraged the use of RAPID in a production environment. The idea sounded good, but at \$20,000 or more for the whole package, it was a tough sell.

It was so tough, that if you happened to order during the right moon phase (probably fiscal year-end but the exact date and year escapes me), HP actually gave away the entire RAPID package as part of a hardware system upgrade. Does that sound like a strategic product? It didn't to me at the time and, thankfully, I resisted the temptation to use the package extensively. I didn't have many block mode terminals anyway, but I'll take some credit for being prescient.

Many customers, however, ignored the "prototyping tool" designation and went on to build elaborate systems completely in RAPID. HP didn't object too loudly because RAPID was a mips-guzzler, which generated hardware upgrades. So, even though RAPID probably did not generate many new system sales or attract third-party software developers, Hewlett-Packard did get a fistful of dollars out of it.

Around 1987, HP apparently decided to put what few resources were being used for TRANSACT to better use and tried to kill RAPID. The company was, as is usual in these cases, rather clumsy about it. The rise of SIGRAPID and the now famous public letter to John Young ensued. Whether the company truly changed its collective mind, even if only

for a few years, or just sought to buy time, we will probably never know. In any event, some promises were made, SIGRAPID was mollified and life went back to normal.

Then comes 1990. In late spring, a SIGRAPID member excitedly told me about this fantastic project that was being worked on at HP Australia. He said it would revolutionize the way we use the HP 3000. Of course he couldn't say anymore because he had been sworn to secrecy.

Software That Sells Hardware

HP is *not* a software company. It is the manufacturer of high-quality, and all too often, high-priced, electronic equipment (computers, peripherals, instrumentation, etc.). In the Corporate Profile included in its 1989 Annual Report, we read: "Hewlett-Packard Company designs, manufactures and services electronic products and systems for measurement and computation." Does this sound like a software company? It doesn't even sound like a company where software plays a role.

For the most part, software at HP is seen as either a necessary component for the use of a product (e.g., MPE on the HP 3000) or as a device to leverage hardware sales. IMAGE is a good historical example of the latter, although it isn't perceived to play that role anymore.

Likewise, RAPID was purchased to leverage hardware sales. It wasn't designed at HP and immediately suffered from the "not invented here" syndrome. Enhancements were always difficult to come by. Every component of RAPID except TRANSACT was either replaced by (SYSTEM DICTIONARY for DICTIONARY/3000 and BRW for REPORT/3000), or abandoned in favor of (INFORMATION ACCESS for INFORM/3000) an HP-developed product.

Would a software company treat customers this way? It's not too likely.

Also, consider this: There are few things more basic to a multiuser computer system than a file copier, spooler

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and text editor. EDITOR was an embarrassment in the 1970s, yet it never was enhanced significantly. QUERY, FCOPY and SPOOK are further examples of software that is an embarrassment. You have to wonder where all your software support fees go. If MPE V is a mature and stable operating system, why is the latest SSB three inches thick?

HP doesn't enhance software products. Rather, it replaces them with new products that you have to buy. This seems to be the only way it can make money from software. Consequently, we have HPEDIT and EDITOR. We have TURBOSTORE and STORE. INFORM, one of the original RAPID products, was designed as an end-user query tool. It had a nice character-based front end for non-programmers, but wasn't very smart when it came to finding and reporting. But instead of enhancements to INFORM, we got a separate product with a separate license fee: INFORMATION ACCESS (it has existed under several names).

Count Your Blessings

That HP never learned to make money from software is probably just as well. If it had, there would be more than a few things it could do to make life miserable. Can you imagine software upgrade fees? Or a software meter like the one DEC is rumored to be considering?

I'm convinced that a significant faction within HP wants to get out of the software business altogether, except where it's absolutely necessary for selling hardware. That may include ultimately scrapping MPE in favor of HP-UX or some follow-on variant of UNIX. Consider for a moment where HP spends its advertising and research dollars.

As for you folks with systems written predominantly in TRANSACT: Does the phrase "prototyping tool" ring any bells? There was a time when it was as popular with HP as "paradigm" and "open systems" are today. It was how RAPID was described and sold. Even if you believed RAPID was a strategic product for HP, you have only yourself to blame for using it inappropriately.

Finally, why wasn't Hewlett-Packard better prepared for the reaction of TRANSACT users? Why didn't it expect a charged atmosphere? After all, SIGRAPID has been the most vocal and visible of the SIGs. They appeared to have engineered the reversal of an earlier decision to scrap RAPID by, among other things, writing a very public letter to John Young. Did HP execs think the SIGRAPID members would just go off quietly into the night? Do we have an out of control bureaucracy here? Do we have a lack of consistent leadership? Probably yes to all three.

Buy Software Elsewhere

HP is *not* a software company, and it's wise to get itself out of the 4GL, application development tool business. Sticking to what it does best will ultimately benefit the company, its customers and its stockholders.

RAPID users should *run* not walk to take advantage of the migration deals offered by Cognos and Infocentre. In the process, they can applaud HP for its commitment to taking care of existing users. In a sense, like it or not, HP is bailing you out. It didn't have to work out the migration deals. Considering that most successful corporations aren't altruistic by nature, I'm sure the anticipated flak from SIGRAPID helped this policy along. But you could have been left out in the cold.

You could continue using RAPID on your existing applications. HP will continue to support you. For the future, though, you should take advantage of your good fortune and start using software tools from a software company.

All users of HP systems need to reflect on who they work for and what their priorities are. Managers of HP 3000 systems especially need to start thinking like business people. Maybe "open systems" will be with us for a long time. Maybe it will be just another fad. The point is that in dealing with HP or any other vendor do not confuse your strategic interests with those of the vendor. Know

what each vendor's strengths and priorities are. Do *not* tie your interests into vendor promises.

Closer Cooperation

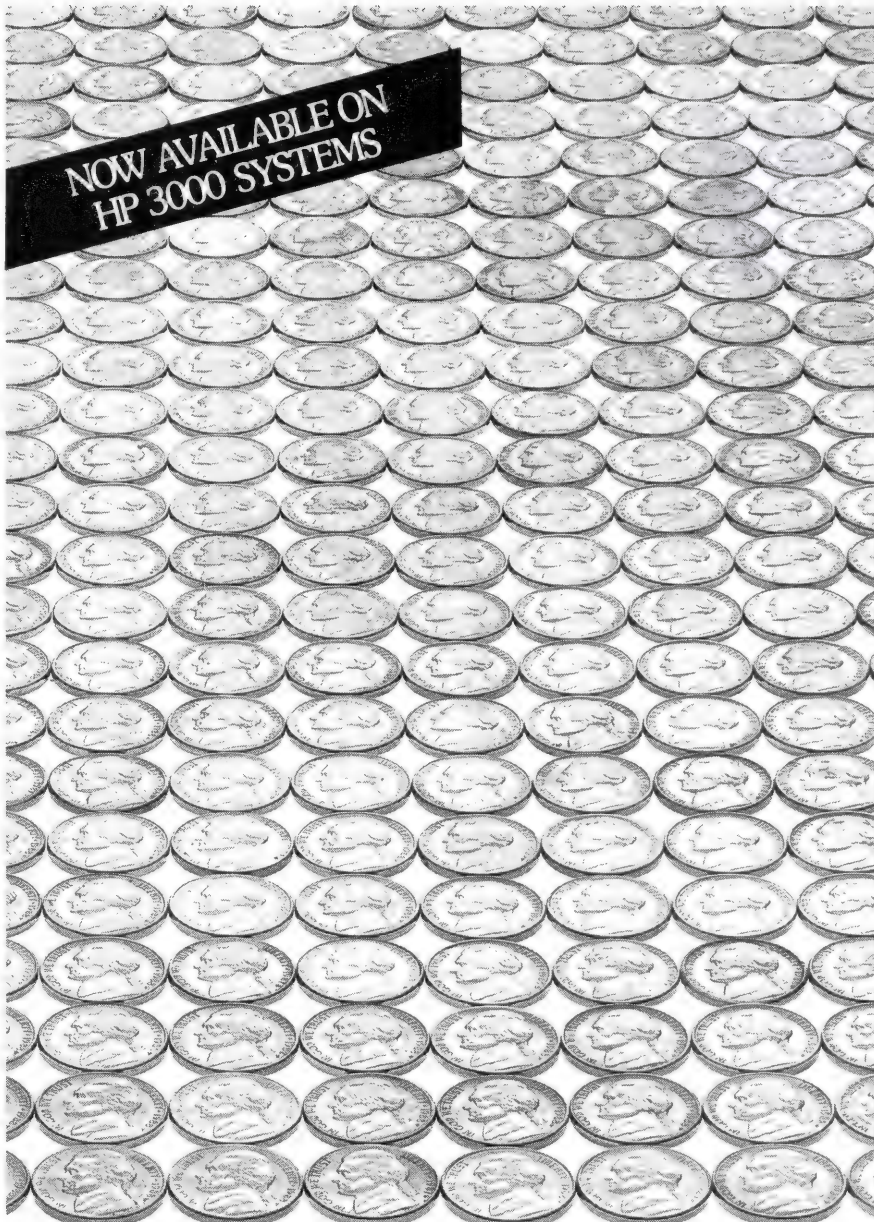
I would like to see HP develop closer and better ties with existing users. The company now realizes (at least until the winds of IS change again) that it can't do everything and please everyone. The user community also needs to realize and understand this. Hewlett-Packard needs to be more open with its customers about its long term strategies.

HP CEO John Young has taken an active statesman's role in the computer/electronics industry — nothing wrong there. He's generated good will and publicity for HP. However, I think HP has tended to drift somewhat aimlessly from one fad to another because there wasn't firm, consistent direction from the helm. But maybe that's just the nature of a large bureaucracy. Hopefully, the elevation of Dean Morton to a kind of co-CEO role will help the company better and more publicly define its direction.

One of the greatest weapons in Hewlett-Packard's marketing arsenal to capture new HP 3000 customers should be the installed base. After all, who's giving the company all those high ratings in Datapro and the other surveys the marketing folks love to show off? It's in both HP's and its existing customers' long term, enlightened self-interests to cooperate rather than feud.

The times *are* changing, perhaps more rapidly than many of us want. But they *will* change nonetheless. We can either cooperate and influence the change or flail away in frustration and be left behind. —*John P. Burke is the system manager for Construction Computer Center, Philadelphia, PA.*

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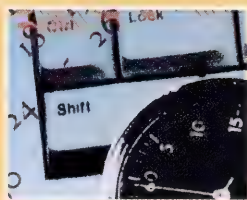
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HP-UX

Andy Feibus

I'm completing a job for a client in which I ported its application from a Sun Microsystems workstation running SunOS to the HP 9000 Series 800 and 400 running HP-UX, the Digital DECstation running ULTRIX, the VAX running (ugh!) VMS, the IBM RS/6000 running AIX version 3.1, and the Data General Aviiion running DG/UX.

The application contains both FORTRAN and C code, and the original user interface (under SunOS) incorporates both SunView graphical windows and a standard ASCII terminal window. Because only Sun workstations run SunView, the user interface had to be changed to use X Windows and the Open Software Foundation (OSF) graphical user interface Motif.

Here, I'll provide some insight into the current state of portability and compatibility between the currently popular UNIX-compatible workstations. I won't comment on the horrendous effort required to port to VMS (actually, I won't comment further), because only DEC considers VMS "the operating system of the future."

Sun SPARCstation

The first task in the port was to remove as much SunOS-specific code as possible and replace it with standard UNIX System V or POSIX code. Unfortunately, SunOS is not POSIX (IEEE 1003.1-1988) compliant, and it only complies with System V at the subroutine level. All other target platforms for this application were POSIX compliant.

Two examples of this incompatibility:

- System V uses the **lp** command to spool print jobs; SunOS uses the **lpr** command. Because the application's printer interface

was hard-coded to use the options available with **lpr**, this interface had to change.

- To program the terminal interface, I was able to use the POSIX terminal interface (see `termios(7)`) on every platform except for the Sun workstation.

Additionally, because Sun supports graphical user interfaces that aren't available from any other major workstation vendor (SunView, Open Look, and NeWs), a new graphical user interface had to be written using Motif (which is available on all other target platforms). Creating a minimal subset of the original user interface required about four weeks.

The SunOS FORTRAN compiler supports more system interface subroutines (e.g., `fseek(3)` is available from within FORTRAN) than available on other platforms. Because the application wasn't originally written for portability, several of these routines were used in the FORTRAN code. As a result, these subroutines had to be emulated on the other platforms using either C code or slower FORTRAN algorithms. This conversion took a few days and made the code much more portable as a result.

The only other item to note is that the Sun systems kept panicking (and halting) for no apparent reason. My clients found this normal, because they had only used Sun workstations; I found it irritating.

HP 9000 Series 800

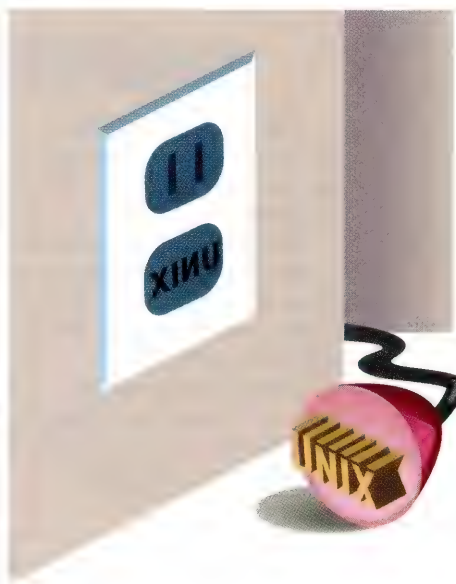
The HP 9000 Series 800 running HP-UX version 7.0 was the first target platform for the application port. HP-UX is both POSIX- and System V-compliant. Additionally, HP-UX offers many of the subroutines provided with the Berkeley Software Distribution (BSD) version of UNIX. Because SunOS is based on BSD, using these subroutines made porting the application quicker.

As I said, redoing the graphical user interface using Motif required about four weeks. The remainder of the port (once I understood the application) required about five weeks to complete. Because HP-UX (the System V-compliant implementation) was originally released in 1985, it is the most mature of the UNIX-like operating systems on which I've worked. The compilers are fine, although (as I already mentioned) the FORTRAN compiler didn't provide as many system interface subroutines as the SunOS FORTRAN compiler.

The only negative comments (from my client) about the port concerned the slow speed of the X Windows-based user interface. SunView provides a graphical interface that permits applications to directly manipulate the graphics hardware (similar to HP's Starbase). X Windows is hardware independent, so it's slower when performing similar operations.

HP 9000 Series 400

Following right on the heels of the Series 800, the Series 400 was a dream port. Both platforms run HP-UX version 7.0;



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the only difference between the two is the FORTRAN compiler, which was a minimal problem. Reportedly, this difference will be eliminated in HP-UX version 8.0.

Again, the only negative comments concerned the speed of the user interface. The horsepower provided by the HP 9000 Series 300 (and early 400s) is inadequate for memory- and compute-intensive graphical applications. All told, this port only required three weeks, including testing of the more than 60 programs in the application.

Digital DECstation

Porting to Digital's RISC-based ULTRIX was the next task. By this point, the bulk of the FORTRAN code was portable and only the C code required modification. Also, ULTRIX originated from BSD and then added System V and POSIX features. A combination of the SunOS-specific and HP-UX-specific code was used to perform the port. In general, I had three problems with this platform, which were irritating, but not debilitating.

The first problem was that DEC does not (yet) consider the Motif user interface to be a standard part of their DECstation software; it's an add-on product. Their Motif implementation operates like a hybrid of Motif and DECwindows. The ULTRIX Motif include files and libraries are located in the directory `/usr/lib/DXM`; all other systems placed the Motif include files in `/usr/include` and the libraries in `/usr/lib`. I had to create numerous symbolic links to these directories before I could compile the user interface code.

The second problem concerned the compilers and linker. When linking the code, I kept receiving a message instructing me to use the `-Gnum` option. However, my documentation didn't describe what this option did, why I needed it, or what the proper value for `num` should be. After a few days, my Digital support engineer explained why. The RISC architecture used in the DECstation product line includes a high-speed cache area for all external symbols (e.g., vari-

ables in FORTRAN COMMON blocks). If too many variables are declared external, you have to instruct the compilers and the linker to limit the variables placed into the cache area. This limitation is specified using the `-G` option during both compile phase and link phase.

The final problem concerned using the RS-232 interface provided with the

Most applications require support beyond the vanilla standards; the best systems offer this support.

DECstation. The `stty(1)` settings required to control the serial data interfaces on the HP workstations caused the DECstation interface to hang. Once the serial interface hung, any program subsequently attempting to access it would hang. Only rebooting the system would clear the condition. I still don't know why this happened. After a little experimentation, however, I found another way to set the interface to the desired settings and the problem disappeared.

In general, the DECstation was the fastest workstation to which the application was ported. Because of the faster speed, the X Windows-based user interface provided speeds approaching that of the SunView-based user interface. This port, including testing, required about four weeks.

IBM RS/6000

Not only does AIX version 3.1 support POSIX, ANSI, and System V, but also BSD. Additionally, with AIX you can choose the standards to which you want to adhere. Because the application code combined features of System V, POSIX, and BSD, I chose to use all of these standards. Unfortunately, one of the C modules wouldn't compile when all standards were used, because the standards, in certain cases, conflict.

At this time, I've only completed 80

percent of the port to this system. Mostly, I've found several problems in the compilers, the operating system, and the X Windows/Motif interface. I'm presently waiting for a fix to an X Windows problem that (according to IBM) occurs on all RS/6000 platforms. The problem isn't caused by anything complex in my user interface code and should have been detected before the operating system was released. Because of these problems, I've found the RS/6000 frustrating.

The RS/6000 arrived with very little printed documentation. Almost all of the documentation is online and is viewed with a utility called InfoExplorer. The problem is: Where do I start? The online documentation is organized into a database, so I can easily use it as a reference manual. But as a user's guide, it's useless. I also haven't figured out how to print a whole manual (e.g., the *C Reference Manual*) from the online documentation.

Some other problems of the RS/6000 include:

- The system administration is much more complex and less intuitive (just adding the system to an existing network took me several days; adding the HP 9000 Series 400 took about an hour).
- The print spooler is mind numbingly complex.
- The tape drive's programmatic interface is different from every other UNIX system I've seen (and the differences aren't necessary).

Don't get me wrong, I don't necessarily dislike the RS/6000. I just have a hard time understanding why it has to be so different.

The performance of the system I used (the PowerStation 520) was less than I expected. Compiling the application code was about as fast as the DECstation 5000, but X Windows graphics performance was about half as fast.

Data General Aviiion

The other port I've not quite completed is the one to DG/UX. DG/UX provides compliance with POSIX and System V and adds some BSD features. In some

instances, both the BSD and System V functionality are provided, but (to prevent naming conflicts) with different names. One example of this is **sig-pause(2)**, which is available as **sigpause** (System V) and **berk_sigpause** (BSD). The additional functionality is nice, but the (non-standard) name change makes porting applications more difficult.

DG/UX also provides X Windows and Motif. The "standard" C compiler is provided by GNU (similar to "free-ware"); and Green Hills (who?) C and FORTRAN compilers are available.

The FORTRAN compiler was the most vanilla of the lot: No system interface subroutines were provided, and you can't access command-line arguments from within a FORTRAN program. But once I overcame these technical details, the port was pretty generic.

The only major problem I've found with DG is that the X Windows defect found on the IBM RS/6000 is also a problem in DG/UX. I now have two vendors working on the same problem.

The Aviion workstation, although RISC-based, runs about as fast as an HP 9000/425: not impressive, but acceptable for most work. I may be spoiled by the DECstation 5000's performance.

Conclusions

Claims of POSIX and System V compliance don't entirely describe whether a platform is truly "standard" or if an application can be easily ported to it. Most applications require additional support beyond the vanilla standards; the best systems offer this support. A defect-free operating system and compilers also are required for a successful port.

Of the systems I've tried, I prefer porting to HP-UX, because it's the most stable of the UNIX implementations available today. Now, if I only had a faster HP workstation on which to run it.... Rumor has it we'll see some major improvement in this area soon. —*Andy Feibus is an interplatform systems consultant based in Atlanta, GA.*

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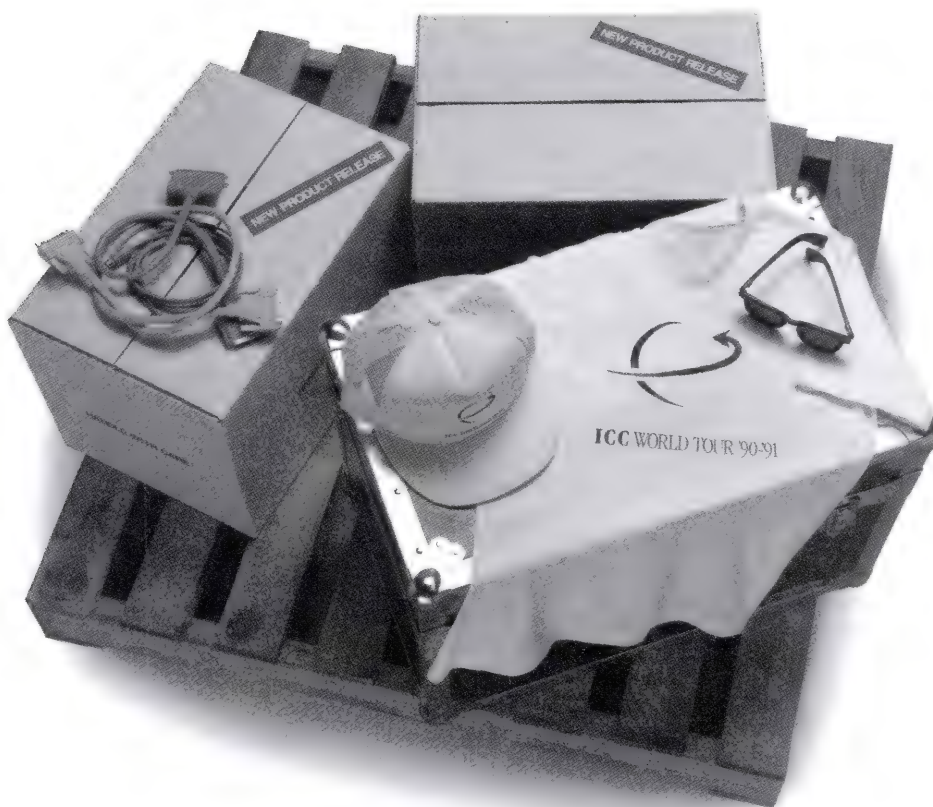
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EUROPEAN WATCH

Marsha Johnston

ternational Editor. Johnston is based in Paris and will contribute European news in addition to this quarterly column.

Since HP announced it was moving its PC Products Division from California to Grenoble, France, the firm has been cited by business publications worldwide as a model corporation for the future; to wit, one with a "transnational structure," and (yawn) a "global strategy."

To kick off *HP Professional's* regular coverage of European markets it seemed appropriate to find out whether some of HP's partner businesses here view HP in the same way.

If you consider a transnational or global corporation to be a company that responds cooperatively to any business partner, regardless of location, the independent software vendors (ISVs) we interviewed did not view HP as such.

Admittedly, we didn't conduct a statistical sampling of the business partner community. Nevertheless, all but one of the partners we interviewed found their business relationship with HP difficult at best and, at worst, so impossible as to preclude signing any future contracts.

The startling responses seemed to suggest that the PCs to Grenoble move was needed to demonstrate a stronger commitment to the European market than most of the interviewees had experienced.

"Everybody talks about going international, but it takes a lot of goodwill to understand that global doesn't mean Canada and Mexico," says Heinz Weiler, director of project marketing for Softlab GmbH, Munich.

"I think we still see competition be-

tween Europe and the U.S.; the two markets are really drifting apart. Even within HP you can see two sides, Europe and the U.S.," he adds.

The Other Cold War

According to Weiler, HP has failed to establish a dialog with European business partners. "Instead of saying [to foreign partner firms] why do you think so [about a certain technology, product, or strategy] and exploring the differences, often HP just says,

'Oh they [Europe] have their own ways of doing things.' There's still a defensive attitude," he says.

When it comes to the CASE tools that Softlab develops and markets, for example, Weiler says he would like to see HP look for a more cooperative solution that bridges technological gaps between the U.S. and Europe.

"It's very difficult to get information from HP; we don't try because we tried for many years," says Didier Voeltzel, president of Sedasis (Brest, France), a maker of optical storage and DAT tape drives for the HP 3000, which has worked with HP for eight years.

Sedasis tried to get HP to provide technical details about the architecture of the HP 9000 series and to answer queries about the new UNIX operating system. It needed the information to develop a frame grabber board that used the 9000's standard DUI interface for its medical and meteorology markets.

"We tried to solve the problems alone, we had no other solution," Voeltzel continues. "Two or three years

ago, we cancelled the OEM contract because HP was being very aggressive with end users, and giving discounts bigger than we had with our OEM contract."

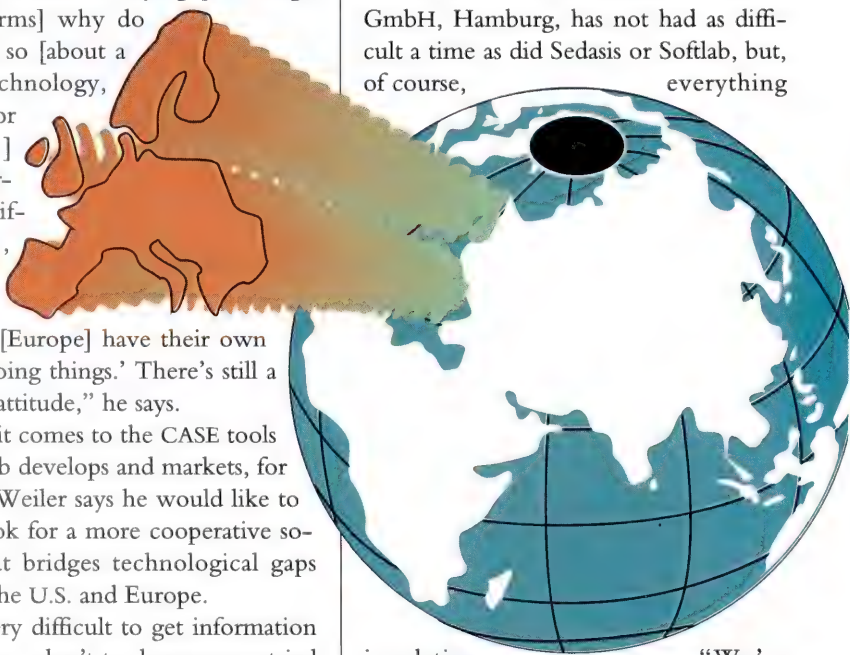
Sedasis does, however, still sell products for HP systems.

As an ISV of backup utility software for the HP 9000, HICOMP Hinrichs GmbH, Hamburg, has not had as difficult a time as did Sedasis or Softlab, but, of course, everything

is relative.

"We're pretty dependent on getting in-depth operating system information," says CEO Uwe Hinrichs. "With each MPE release, documentation is provided, but it's not detailed. There's no background information and because we deal with the file system, we need internal information. We have sources where we get information, but they're not official. It's only a small window and probably not all that we need."

According to Hinrichs, the official sources in Cupertino and HP's Support Center in Boeblingen, Germany haven't been allowed to give out any informa-



tion below a certain level. Hinrichs doesn't fault his account rep in Boeblingen, saying only that "he's just one person; we could probably do more, more efficiently if we had direct access, such as manuals and documents, to information on the structure of the system."

A Crack In The Wall

Luckily, Hinrichs has seen evidence since the move to Grenoble that the situation may be improving. "It seems they have redesigned the connection to ISVs," Hinrichs says. "In the past it was hard to get into the ISV program for each division; if you applied to one you couldn't necessarily get into the other."

For his company, he adds, which is already an ISV for the Computer Products Group in Greeley and provides products to the HP customer base worldwide, it has been difficult to get into HP. "But it looks like it's going to be changed; I know definitely that a couple of people are leaving. We got a couple of questionnaires from the Computer Systems Group, asking what we would need to be competitive with other companies. Since we're used to not getting all of the information we need, it was very amazing," he says.

Specifically, he notes, Precision Architecture RISC systems have been tightly guarded. Almost no one could get source code. "One of the questions was, 'Are you interested in source code?' A lot of computer companies have learned that the more people who know your system, the more products will be on the market. It's [giving full information to ISVs] also vital to their success in the market with a proprietary operating system," Hinrichs says.

Hinrichs' perception of greater cooperation with ISVs here seems to reflect more than a subtle shift in policy, which could be the result of the change in management at Computer Systems Group that took place last fall.

Openness And Restructuring

But then, according to Heinz Heining, HP's marketing manager for all partner

business in Europe, a policy of working closely with partners is "in principle, not a recent change, but maybe some companies only experienced it recently. Over the last two or three years, there has been a strong move toward working closer and closer with independent software companies, which went along with our move toward open systems, because we have to work with other suppliers."

He acknowledges, however, that HP "did have problems in some areas; to those companies in the last 18 months we have sent R&D engineers to solve some of these problems. [Consequently,] some people may say it's [the relationship] been better for the last 18 months and others might say it's only been recently."

Neither, says Heining, is the survey that Hinrichs received new. "For years we have had supplier surveys running. It might be that the company was addressed for the first time. We always try to include the bigger, more important companies and try to select the smaller ones," he explains.

It isn't hard to understand the huge amount of resources it would take to keep track of the needs of every business partner. But the only problem with a policy such as Heining describes is the gamble that the companies you pick to survey may not turn out to be the ones with technology you will need in the future. And just maybe, when you decide you need them, they already will have left for plusher quarters.

Says Sedasis' Voeltzle, "We sell very few products for HP now; we are just conserving the customer base. We are trying to work with IBM, because IBM [is] not so bad about competing with their OEMs."

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CSI Unveils Oracle SQL Database Interface

Convergent Solutions Inc. (CSI) announced the availability of CS/ADS Release 6.0, which includes an Oracle SQL database interface.

CS/ADS is a tool set that provides a high-productivity development environment for building complex business applications and information systems. CS/ADS allows applications to be built that are portable between different hardware platforms, operating systems and database management systems. CSI's approach allows applications to be database-independent yet still incorporate the full power of the RDBMS.

CS/ADS is based around a 4GL. It combines high-level language constructs, data independence and data type transparency with the programming structure of traditional third generation languages. This allows developers to complete complex applications without having to resort to C programming.

CS/ADS incorporates a dynamic data dictionary that contains global, non-redundant definitions of editing, verification and domain rules for data items. The dictionary also provides global definitions of data structures, forms, menus and 4GL procedures. New users require about 300 KB of memory.

Contact Convergent Solutions Inc., 100 Metro Park, S., Laurence Harbor, NJ 08878; (201) 290-0900.

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Genoa Adds ATSS To Product Line

Genoa Technology added Application Test Suites (ATSS) to its product line. ATSS for the LaserJet II (PCL-4), LaserJet III (PCL-5) and PostScript emulations now are available.

Genoa's ATSS are used by the printer industry to ensure that printer products are compatible with major application programs on the market. The new Application Test Suites are comprised of professional "real world" documents specially designed to exercise application printer drivers to assure compatibility with mainstream applications.

Genoa's ATSS incorporate fonts, scanned images and graphic elements. The ATSS consistently exercises a majority of PCL/PDL commands available to the driver. The ATSS is distributed on CD-ROM that allows complex test files to be created without regard to file size. Genoa includes ATSS utilities that provide rapid structured environments for resolving problems uncovered during emulation testing.

Prices for the ATSS begin at \$9,500.

Contact Genoa Technology, 2245 First St., Ste. 212, Simi Valley, CA 93065; (805) 583-2677.

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Eventide Releases Memory Boards For HPs

Eventide Inc. added several high-density memory boards to its line of memory boards for HP computers. Included is the WR375-32M, a 32 MB memory board pair for the HP 9000 375 computer. Eventide uses double-sided surface mount technology and

4 MB RAM chips.

Other new additions include the WR375-8M and -4M, 8 MB and 4 MB boards for HP 9000/345 and 375 computers; the WR360-12M and -4M, 12 and 4 MB boards for the HP 9000/360; the WR340-4M, 4 MB board for the HP 9000/340; and the WR332-4M and -1M, 4 MB and 1 MB boards for the HP 9000/332.

Contact Eventide Inc., One Alsan Way, Little Ferry, NJ 07643; (800) 446-7878.

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Tigre Builds Graphical Applications

Tigre Object Systems Inc. announced the Tigre Programming Environment, software that speeds development of complex graphical user interface software, rapidly creating applications in full color. The product is offered on a range of platforms, including the HP 9000 Series 300/400 and Apollo Series 2500, 3500 and 4500.

The object-oriented system consists of the



Genoa Technology's Application Test Suites now are available for the LaserJet II, III and PostScript emulations.

Tigre Interface Designer and the multimedia-capable Tigris multiuser database system. The Tigre Programming Environment is written in and based on Objectworks/Smalltalk by ParcPlace Systems (Palo Alto, CA).

The Tigre Interface Designer consists of easy-to-learn tools and a complete library of user interface object classes also known as "Widgets." Tigre is Tigre's multiuser object-oriented database manager bundled with the Tigre Development Environment. Tigris implements a Persistent Objects Store allowing multiuser access to any arbitrary type of data.

The price of the Tigre Programming Environment Version 1.2 is \$3,500. Contact Tigre Object Systems Inc., 3641C Soquel Dr., Soquel, CA 95073; (408) 476-1854.

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TetraScan Available On HP-UX Workstations

Tetra Systems Inc. introduced the TSI 98312 TetraScan Image Scanner System for the HP 9000 Series 300/400 workstations.

The TetraScan Image Scanner System provides an OSF/Motif-based application interface to standard scanner products such as the HP ScanJet, Ricoh IS-30 and Howtek Scanmaster. A parallel scanner interface board is included in the standard configuration.

TetraScan's graphical user interface allows the operator to interactively select the area to be scanned while providing control over scan parameters, including image resolution, quantization and halftoning.

TetraScan is priced at \$2,495. Software-only and accelerated configurations are available from \$1,495 to \$4,700.

Contact Tetra Systems Inc., 809 San Antonio Rd., Palo Alto, CA 94303; (415) 493-7290.

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ASK Announces MANMAN/AUTOMOTIVE

ASK Computer Systems announced MANMAN/AUTOMOTIVE, an electronic data interchange (EDI) and release accounting system for automotive suppliers. MANMAN/

AUTOMOTIVE is an addition to MANMAN, ASK's manufacturing information system that supports accounting, manufacturing, order management and other planning functions.

MANMAN is a closed loop corporate-wide information system that offers integrated automotive functionality from the receipt of an electronic release to the transmission of an advance shipment notice.

MANMAN/AUTOMOTIVE is integrated with MANMAN/OMAR (order management) and MANMAN/MFG (manufacturing functions) to provide users with the visibility and control of current customer demand to effectively manage planning, production and decision-making. It requires no special programming or table definitions and is window- and menu-driven. Contact ASK Computer Systems Inc., 2440 W. El Camino Real, Mountain View, CA 94039-7640; (415) 969-4442.

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EMERALD Collection Features MPE XL Utilities

Software Research Northwest Inc. announced the availability of the Nuggets EMERALD Collection of MPE XL utilities. Developed as part of an on-going joint venture with Denkart NV (Molenweg, Belgium), and Allegro Consultants Inc. (Redwood City, CA), Nuggets consist of a family of MPE XL utilities, each released as part of a continuing series of collections.

The EMERALD Collection includes six new routines. The BLAZE utility uses terminal windowing to explore the MPE file structure, with options to view, purge, copy or move files. CASPER is a SPOOK look-alike that works with the Native Mode Spooler. MAGNET is a fast file search utility for finding files within defined filesets that contain selected words. The BETIMES utility allows the system clock to be dynamically reset, either programmatically or from a standalone program. AVATAR is a decompiler for native mode object modules, presenting the information in a variety of

formats. The REDWOOD utility scans log files that report file usage, with often-accessed files highlighted.

Contact Software Research Northwest Inc., 17710-100th Ave. S.W., Vashon Island, WA 98070; (206) 463-3030.

Circle 385 on reader card

FANTASIA Supplies New Page Formatting Functions

Proactive Systems announced a new release of the FANTASIA software (version E.03). FANTASIA supplies forms printing, graphics, report enhancement and other page formatting functions for HP 3000 LaserJet users.

The main page formatting program is now in native mode for MPE XL systems. This typically makes it about three times faster than the previous release with a corresponding reduction in CPU time consumed. Several enhancements have been incorporated to the charting facilities of the software to make production of sophisticated bar, line and pie charts easier.

More free fonts now are included and the two of five Interleaved bar codes are supported. Support of the LaserJet III has been extended including scalable fonts, shaded/patterned characters, inverse printing, font rotation, etc.

Contact Proactive Systems, Four Main St., Los Altos, CA 94022; (415) 949-9100.

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Infotek Systems Announces New Drive Family For HP, Sun

Infotek Systems announced a new line of mass storage peripherals for HP and Sun workstations. The Infotek Systems MS Series disk drives combine superior reliability with fast access times, high capacity and an industry standard SCSI interface.

The MS Series drives are enclosed in a double height cabinet. Formatted sizes are 332, 664 and 1000 MB and may be used in any combination.

Contact Infotek Systems, 1045 S. East St., Anaheim, CA 92805; (800) 227-0218.

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BACKLink Gives Systemizer LAN-Like Function

Connexpts, a division of Applied Creative Technology Inc., announced a new memory-resident utility called BACKLink, that allows Systemizer users to transfer files to and from hard drives of their coworkers without interrupting them.

Systemizing is available as an internal DOS-compatible slot card (the Systemizer SC) and an external module (the Systemizer Plus) that's compatible with any computer or peripheral, and any operating system or program.

BACKLink takes 27 KB of PC RAM when used with a Systemizer Plus and 15 KB when used with a Systemizer SC. Once installed on every PC in a Systemizer network, BACKLink enables users to exchange files in the background of their applications. It supersedes ACTLink, a file transfer application that required the participation of two users to transfer data. Contact Connexpts, 8333 Douglas Ave., 7th Fl., Dallas, TX 75225; (214) 739-4200.

Circle 384 on reader card

Reflection Training Includes Hands-On Exercises

WRQ and McKittrick Associates Inc. released the Reflection Self-paced Training System, a course on Reflection terminal emulation software products.

The system consists of three audio tapes and a workbook that include "hands-on" exercises that allow students to move through the course at their own pace. Topics covered include command language, file transfer, keyboard mapping, configurations, troubleshooting and graphics. Price is \$95. Contact McKittrick Associates Inc., 5547 S. Yampa St., Aurora, CO 80015; (303) 690-1550.

Circle 383 on reader card

Pacific Data Connects Five Computers To One LaserJet

Pacific Data Products announced the addition of Pacific Connect to its line of connectivity products. It's a low-cost printer sharing device that allows any combination of up to five PCs or four Macintoshes to be simultaneously connected to one HP LaserJet Series II, IID, III or IIID. It also provides the ability to connect to a mainframe or minicomputer.

Pacific Connect is transparent to the user and functions as though each computer were

connected to a dedicated LaserJet printer. Once a document is sent to the printer, it's stored in the 256 KB spooling buffer and then printed in the order received to allow the user to return immediately to their application.

Pacific Connect is installed in the printer's optional I/O slot and is available with either 256 KB (upgradeable to 1.25 MB) or 1.25 MB of spooling memory that allows the printer to store documents that are sent simultaneously.

Price of Pacific Connect is \$399 for the 256 KB version and \$499 for the 1.25 MB version.

Contact Pacific Data Products, 9125 Rehco Rd., San Diego, CA 92121; (619) 552-0880.

Circle 375 on reader card

Bradly Advances GINO Graphics Systems

Bradly Associates completed a two-year software development program with the release of new versions of the GINO family of graphics systems.

The new versions of GINO-F, GINOGRAPH and GINOSURF possess several new graphics features, including Computer Graphics Metafile (CGM) driver and interpreter, software segment handling, polar plots and 4-D data display on surfaces.

GINO's new 3-D graphics libraries are available on almost all graphics hardware platforms and run under HP-UX.

Contact Bradly Associates Ltd., Manhattan House, 140 High St., Crowthorne, Berkshire RG117AT; 0344 779381.

Circle 381 on reader card

Hindsight Increases Productivity

Advanced Software Automation Inc. (ASA) introduced a new workbench designed to speed work on existing code. The new software maintenance environment, Hindsight, specifically reduces the time spent on understanding existing software code.

Designed to both increase software maintenance productivity and simplify management, Hindsight uses graphics, interactive structure charts and active logic diagrams to speed understanding and give immediate feedback about the effects of code modifications on the rest of the program. Hindsight also pinpoints test coverage deficiencies and automatically updates documentation directly from the code.

Hindsight works with existing C code on

most UNIX workstations running Motif, Open Look or SunView (including Apollo, DEC, IBM and Sun) in both standalone and network configurations.

Hindsight is priced from \$12,000 to \$23,000.

Contact ASA, 2880 Lakeside Dr., Ste. 226, Santa Clara, CA 95054; (408) 492-1668.

Circle 376 on reader card

HIBACK/UX Supports SunOs

HI-COMP announced that current HIBACK/UX's support of MPE V, MPE XL and HP-UX, with complete compatibility between those operating systems have now progressed to include SunOs, the UNIX operating system on Sun machines.

Use of HI-COMP's backup tool means that users can share a mass storage device like the optical disk jukebox, also fully supported by HIBACK, to provide true unattended backup of the complete network.

Contact HI-COMP America Inc., 588 Broadway, Ste. 810, New York, NY 10012; (212) 334-8310.

Circle 379 on reader card

Mathematica Available On HP Apollo Series 10000

HP and Solfram Research Inc. announced the availability of Mathematica, a software system designed to perform mathematical equations on the Apollo Series 10000 personal supercomputer from HP's Apollo Systems Division.

Mathematica is a general mathematical computation system and language that performs interactive numerical, symbolic and graphical computations, and incorporates a high-level programming language and applications generator.

In addition, HP introduced several Series 10000 system enhancements, including a cpu that doubles current performance levels from 22 to 44 mips per processor; compiler technology that further boosts system performance; higher-performance and greater-capacity storage products; and support for a variety of new communications products that improve network flexibility.

Price for a two-process license for Mathematica starts at \$4,995.

Contact Wolfram Research Inc., 100 Trade Center Dr., Champagne, IL 61820; (217) 398-0700.

Circle 378 on reader card

IDE Introduces OOSD/C++

Interactive Development Environments Inc. (IDE) announced the addition of Object-Oriented Structured Design (OOSD)/C++ to its Software through Pictures family of CASE products.

OOSD/C++ includes a graphical design editor that automates the standard OOSD notation extended for C++. Key features include C++-specific drawing rules, that minimize errors, and the C++ Reuse Library and Browser, that reinforce the reuse capabilities of object-oriented languages while still in the design phase. OOSD/C++ also includes data modeling editors, a central repository, document preparation and version control.

An automated training tool that provides drawing support for the OOSD notation extended for C++ is available as part of the recently introduced "Development Methods for Migrating from C to C++ using OOSD" course.

OOSD/C++ will be available as part of an open solution, called the C++ Development Environment, that will be introduced in phases during 1991.

Contact IDE, 595 Market St., 10th Fl., San Francisco, CA 94105; (415) 543-0900.

Circle 373 on reader card

Unison's DCM/PAK Integrates Additional Functions

Unison Software announced enhancements to DCM/PAK, the newest addition to its product line of HP 3000 data center management software. DCM/PAK automates and integrates the key data center functions of batch job processing, report generation and distribution, and tape library maintenance.

The latest release includes an auto-installer feature that guides the user through a simplified installation process. Enhancements to the Tape Manager module include a new tape staging feature that provides pre-production reports on the tapes required during an upcoming production day.

Enhancements to the Job Manager module include new user-streamed job queues, logon insertion, dynamic dependency control, carry-forward of incomplete schedules, and display of dependent jobs/schedules.

DCM/PAK is available in standalone or networked versions, and runs in any HP 3000 environment on MPE V or MPE XL.

Contact Unison Software, 675 Almanor Ave., Sunnyvale, CA 94086; (408) 245-3000.

Circle 387 on reader card

Saber Software's Saber-C Runs On HP 9000

Saber Software announced that its Saber-C programming environment is available to HP 9000 workstation users.

Software developers using the HP 9000 for C language applications development now have the advantages of Saber-C's incremental development capabilities including Saber-C's full C interpreter, incremental linker, interactive workspace, and suite of graphical program and data browsers, all designed to speed the software development process by simplifying the edit-test-debug cycle. Saber-C also offers a dynamic run-time error detection system.

And, HP 9000 developers can use Saber-C to develop applications that are more portable and easier to maintain. Price is \$2,995 including one year support and maintenance.

Contact Saber Software, 185 Alewife Brook Pkwy., Cambridge, MA 02138; (617) 876-7636.

Circle 370 on reader card

Multilevel Security For Fault-Tolerant UNIX

Sequoia Systems Inc., maker of HP's fault-tolerant system, announced the first multilevel security option of the UNIX operating system available on a multiprocessor fault-tolerant computer. Sequoia offered the option, called Secure TOPIX, in response to the increasing demand for data security in OLTP environments.

Secure TOPIX provides security features for environments where access to sensitive information must be securely managed, a requirement in most mid-to-large commercial and government applications. Secure TOPIX is available as an option to Sequoia's TOPIX operating system.

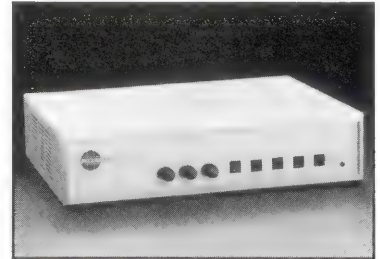
Because the security option protects the privacy of each user's data, it allows users with different security clearances to use the same computer and provides multiple levels of data security.

Secure TOPIX is priced from \$30,000. Contact Sequoia System Inc., 400 Nickerson Rd., Marlborough, MA 01752; (508) 480-0800.

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HP ProbeView 3.0 Includes Network Planning

HP added network-planning capabilities to the HP 4990S LanProbe network-analysis system for LAN management with the introduction of the HP ProbeView 3.0 software.

Consisting of new firmware for the HP LanProbe segment monitor and revised HP ProbeView software, the new software introduces useful network-planning features and also enhances the HP LanProbe's diagnostic capability.

Completely independent of the network equipment and protocols, the HP LanProbe network-analysis system provides comprehensive and informative reporting on Ethernet LAN status.

New features include NODE TRAFFIC, that augments the HP LanProbe system segment view of LAN statistics with a node perspective of LAN traffic; AUTO-POLLING, that allows the user to define schedules to interrogate HP LanProbe segment monitors for map, log and statistics data; ALERT MANAGER, that warns the

user of alerts received simultaneously by multiple HP LanProbes; LOG DUMP, that provides continuous dumping of log messages to a specified device or file of the network manager's choice; and GLOB PLACE, that facilitates the editing of segment maps so they're easily adjusted to reflect the network's actual topology.

ProbeView 3.0 runs under MS-Windows 3.0 and uses an HP Vectra PC, IBM 386 PC or PC-compatibles.

Interface Architect Shortens Interface Development Time

HP introduced the HP Interface Architect, a software tool designed to facilitate development and testing of user interfaces. The company believes HP Interface Architect is the first interface-development tool that allows programmers to develop and test the complete behavior of an application's user interface.

HP Interface Architect supports the development and test of application user interfaces based on the X Window System and Motif. HP Interface Architect runs on the

HP 9000 Series 300, 400 and 800 workstations under the HP-UX 7.0 operating system.

The HP Interface Architect license-to-use ranges from \$5,000 to \$60,000 depending on the number of user licenses purchased. The media and manual package is \$500.

Sedasis Offers Large Capacity Storage

Sedasis introduced the SED 4820, a 2.3 GB storage unit designed to store disk volumes on HP 3000 and MPE V or XL machines.

It enables the storage and the reloading of all disks, interfaced in HP-IB and using the CS/80 protocol and a transmission rate of 10 MB per minute.

The SED 4820 works in remote and local mode. In local mode, it is a completely automatic storage device, and the SED 4820 is then invisible to the computer and it only acts on the HP-IB bus during storage and restorage operations.

Contact Sedasis, 14 rue de Maupertuis, 29601 BREST Cedex FRANCE; 33.98.41.70.90

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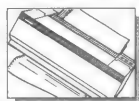
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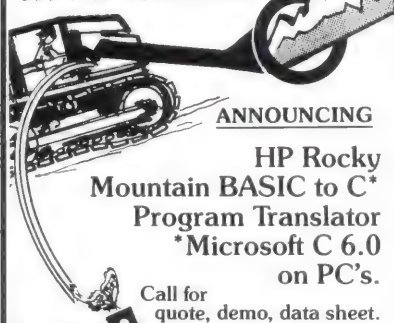
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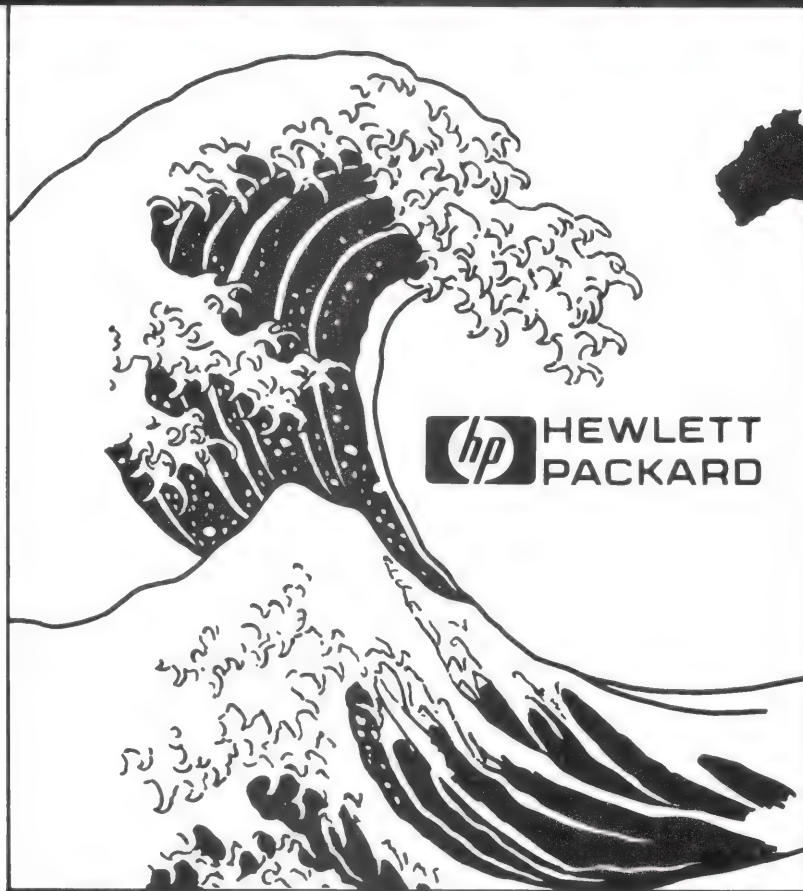
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[CALENDAR]

[APRIL]

4/22-25: NCGA is sponsoring the 12th Annual Conference and Exposition at McCormick Place North, Chicago, IL. Contact Sharon Sutton, (703) 698-9600.

4/29-30: NOWRUG's Annual Conference is scheduled for the Washington State Convention and Trade Center in Seattle, WA. Call (206) 965-1560.

[MAY]

5/8-10: DesCon is sponsoring The Twelfth International Computer Management Show for the Design And Construction Industry, (A/E/C Systems '91). Washington Convention Center, Washington, DC. Call Sharon Price, (800) 451-1196.

5/13-16: The Fifth HP User Group Conference for the South Pacific and Asian region is being held in Melbourne,

Australia. Conference theme is "Riding The New Wave." Contact Mandy Bromilow (613) 429-4322.

5/20-24: Swanson Analysis Systems Inc. is sponsoring the ANSYS Fifth International Conference and Exhibition at the Pittsburgh Hilton and Towers, Pittsburgh, PA. Call Jennifer D'Orazio, (412) 746-3304.

[JUNE]

6/11-14: NECRUG is holding its Twelfth Annual Eastern American HP Users Conference at Trop World Hotel and Casino in Atlantic City, NJ. Call Randy Kauftheil, (215) 251-0736.

6/11-14: Cognos is sponsoring its first international conference, Cognition '91 at the Anaheim Hilton and Towers, Anaheim, CA. Call (800) 444-5986 or (617) 229-5641.

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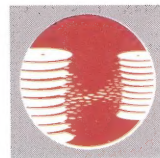
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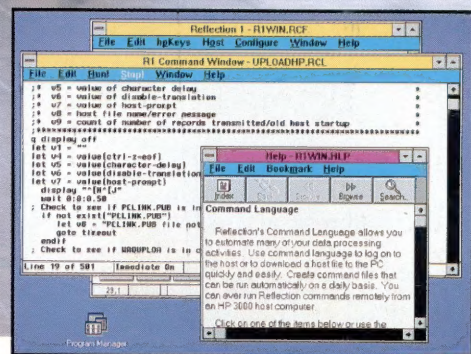
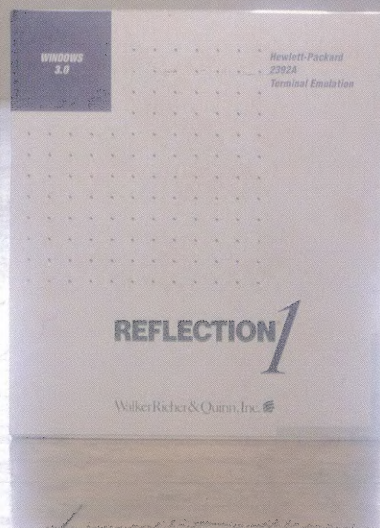
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